THE IRON AGE __ December 27, 1934 __

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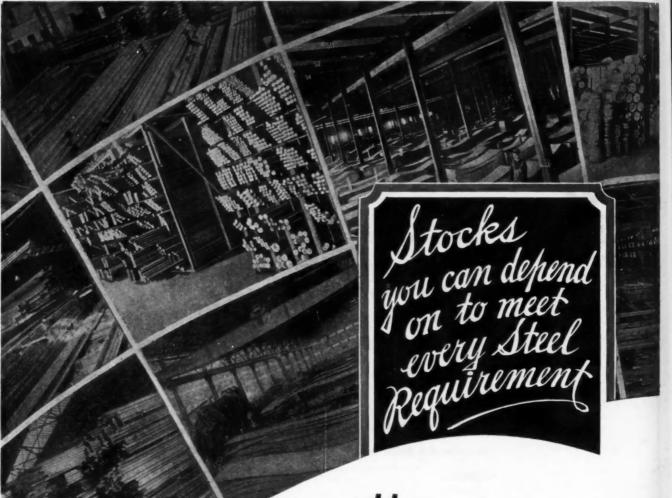
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THE IRON AGE

DECEMBER 27, 1934

ESTABLISHED 1855

Vol. 134, No. 26

Our Biggest Gain Has Been in Good Will

THIS editorial will be a little different from those that you have been accustomed to reading on these pages during the past year.

We have tried, heretofore, to deal fairly and frankly with practical subjects of large importance. Many of these have had to do with the reciprocal relationships between Government and business.

Now, we want to choose the biggest subject of all. It has to do, not with present or prospective legislative or administrative measures, but with something that is basically much more important.

It has to do with good will.

s,

This is, indeed, an appropriate season in which to deal with that subject. And, after all, good will between men, or between men and Government, is of far greater importance than are the mechanisms which men build, or that Government builds, for the purpose of protecting "rights" and keeping the peace.

There can be no permanent peace without good will.

There can be no good will without willingness to discuss and give honest consideration to views that may run contrary to one's own.

It has been said, and truly, we believe, that conformity to the Golden Rule would solve every one of our perplexing, present-day problems. Probably none of us will live long enough to see human nature elevated to a position of personal unselfishness adequate to the general acceptance of the Golden Rule. Great growths do not happen over night.

We believe, however, that the last twelve months have witnessed a longer step in that direction than any similar period in our experience. And this, despite the turmoil and conflict that have tended to obscure a real movement.

Government has become much more tolerant of the just necessities of business. The irascible "you're to blame" attitude of early New Deal days has vanished.

Business has become more tolerant of the broad aims of the Administration. Passivity and resistance are being replaced by a spirit of cooperation.

Therefore, in appraising the gains of 1934, do not stop with increased automobile sales, or carloadings or steel operating rates. Take cognizance of the substantial increase in good will.

For unless you do so, you will miss the biggest fundamental gain of 1934 and the most promising augury for 1935.

JHV aus Deventer

Precision Features Mechanical Construction of 82-Inch Telescope

HE remarkably high degree of precision in the design, construction, and assembly of the large telescopes used in astronomical observatories is frequently overlooked in the general interest in the mirror and lenses. Optical accuracy is of course vital, and hand work of the utmost delicacy features the grinding and polishing of the great mirrors and big lenses. Mirror surfaces must be finished by hand, and the final touches are so delicate as to limit work to a period of only 15 min. per day. Measurements are made in terms of fractions of the length of light

This steadily increasing accuracy of mirror finish requires greater and greater precision in the mechanical parts which comprise the whole telescope. Many parts, of course, have no actual relation to the delicacy of operation, yet others are vitally im-

By R. P. BROWN

portant. These factors are all taken into consideration in modern design, but the necessity for an exceptionally high degree of mechanical accuracy still remains.

In 1926 the late William J. McDonald of Paris, Tex., bequeathed a substantial sum of money to the University of Texas for an astronomical observatory. That university entered into negotiations with the University of Chicago regarding joint operation of the proposed observatory, thereby avoiding needless duplication of equipment and effort. As a result, the University of Texas is building the telescope, dome, and buildings; the University of Chicago will pro-

vide the staff; and the Yerkes Observatory will coordinate the efforts, the director of that institution serving also as director of the McDonald Observatory.

Accordingly, the type of work which was most necessary and which could be handled most efficiently in Texas was thoroughly canvassed in advance. Thus, while the Yerkes Observatory telescope has a 40-in. lens and is 62 ft. long, with a focal ratio of one to nineteen, and is highly efficient for the measurement of double stars, the McDonald reflector will have a concave mirror 82 in. in diameter. The telescope will be only 27 ft. long, with a focal ratio of one to four. However, with twice the aperture, it will have about four times the light gathering power of the Yerkes instrument and will therefore be more efficient for the photography of faint stars and for spectrographic work. In fact, for the photography of faint nebulæ and distant universes, this new telescope will be as powerful as the 100-in. reflecting telescope on Mount Wilson, now the world's largest. For other special work it will be even more powerful.

Dr. Otto Struve, director of the Yerkes Observatory, who also has charge of the new observatory, recently said: "It is not, however, our intention to surpass the remarkable performance of the Mount Wilson telescope, but rather do we hope to supplement it and develop such features which, for one reason or another, are omitted at Mount Wilson. It is our desire to make our work supplementary to that of other institutions and to avoid duplication of any sort."

The Warner & Swasey Co., Cleveland, builder of precision tools and instruments since 1880, were selected to design and build the telescope and the dome. E. P. Burrell, director of engineering, who has previously designed such well known



Anti - friction bearings, when used in a telescope, must be made to meet mathematical requirements for accuracy that are far more severe than would be normally necessary in mechanical operations. The bearing nearest the telescope in the declination sleeve has a bore of 43 in., and outside diameter of 52 in. and a width of 334 in., carrying 76 tapered rolls. Previously no anti-friction bearing had been made with a bore of more than 42 in.

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telescopes as the 72-in. reflecting telescope in Canada and recently the 69-in. Perkins telescope for Ohio Wesleyan University, worked out the design for the new 82-in. unit. The dome for the observatory has already been completed by the company. Work on the telescope is now progressing at the Warner & Swasey plant in Cleveland simultaneously with the grinding and polishing of the huge mirror.

Many mechanical problems enter into the physical construction of the telescope and its auxiliary equipment. No two great telescopes are exactly the same. One major difference lies in the setting of the polar axis, which must be parallel with the axis of the earth so that the revolution of the telescope will be identical with the revolution of the earth. In this instance, the polar axis is set at an angle of 36 deg. 40 min. Near the lower end of the polar axis is attached the actual telescope on what is known as the declination axis, which is at right angles to the polar axis and permits the telescope to be tilted at any desired angle so as to reach all positions in the heavens which are visible from the location. To balance the weight of the telescope, 14 tons, a special counterweight is attached to the polar axis near the top on the opposite side.

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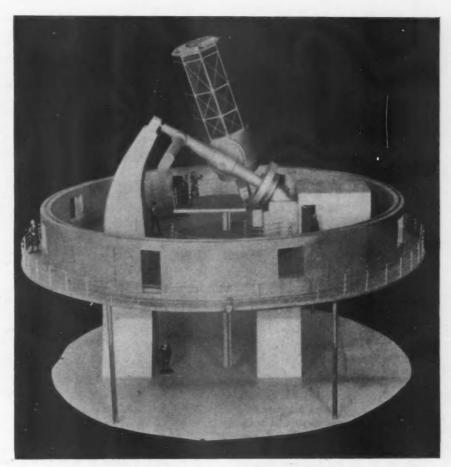
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Keeping pace with the stars requires uniform, steady motion. This is fully automatic and electrically controlled. The main drive motor operates at 1800 r.p.m., connecting through a 1:63 reducer, which, in turn, is coupled to a 1:57 reducer, which drives a worm gear 9 ft. in diameter, having 720 teeth, giving a worm speed of ½ r.p.m. in terms of sidereal time.

The main driving worm gear for the motion in right ascension weighs 1800 lb. This gear is a most important element in the telescope assembly, requires extreme accuracy, and must operate smoothly, for the telescope must follow the stars without lagging at any time. It is particularly important that the anti-friction bearings carrying this gear, which are subjected to both radial and thrust loads, be made to meet mathematical requirements for accuracy far more severe than would normally be necessary in mechanical applications. Timken tapered roller bearings were selected for this task. Two single row bearings, each carrying 39 tapered rollers, are to be installed on this gear. These bearings have a bore of 17 in., an outside diameter of 23% in., and a width of 3 in., and are designed to carry simultaneous radial and thrust loads of 5000 lb. each.



Model of the McDonald telescope as it will be mounted (without dome).

Acceptance tests, without load, showed these bearings to be accurate to 0.001 in. on the outside diameter and to have a run-out of only 0.001 in. When set in place and loaded, even these small fractions will practically disappear, for the tapered roller construction makes possible the most accurate adjustment, and Warner & Swasey insist upon the utmost precision in any piece of equipment they make.

Taking photographs of stars requires plate exposures of from 10 to 30 hr. without a tremor. An exposure may be started on one night and not finished for a week because of atmospheric conditions, rain, clouds, etc. But the telescope must be kept trained on the particular star or group of stars all the time the plate is in position. Run-out in the bearings would cause a minute waver in the curve through which the telescope must move in following the path of the stars and, as a result, the photograph would be blurred. Precision bearings, however, aid materially in avoiding this possibility.

To make possible spectrographic study of the stars many details of this new telescope are specially provided. The starlight, concentrated by the telescope at the McDonald Observatory, is brought into a closed room of constant temperature where laboratory instruments can be most accurately used. In the case of this new instrument, the telescope tube is mounted close to the polar axis and the light rays from the stars transferred from the telescope by a system of mirrors through the hollow declination sleeve into the polar axis tube and down to the spectrographic room, which is located at the lower base of the polar axis mounting.

The telescope tube weighs nearly 14 tons, and the mirror arrangements for transferring light at right angles and down the polar axis seriously handicapped the designers. Both thrust and radial loads had to be considered in connection with the bearings used in mounting the tube, and extreme accuracy was essential. Any inaccuracy would be multiplied by a factor of 276.

Light transfer controlled the size of the bore of the bearings required on the declination sleeve. The bearing nearest the telescope called for a bore of 43 in. and that at the polar axis end of the sleeve, 16 in. Up to the present time no anti-friction bearings had ever been made with a bore of more than 42 in. diameter, and then only in the heavier sizes.

However, Timken had made those units, and so Warner & Swasey put the problem up to them.

The large bearing was required to carry a thrust load of 39,200 lb. and a radial load of 24,500 lb. The opposing bearing had a maximum calculated thrust load of 22,400 lb. and a radial load of 17,000. Not over 0.001 in. runout was allowed and an O.D. tolerance of not greater than 0.0025 in. was permitted. These requirements called for the highest degree of mechanical precision in the manufacture of the bearings, for the accuracy and scientific results of the telescope depended to a considerable degree upon them, for of what use would be the finest mirror if it could not be kept accurately trained on its objective?

The large bearing as made has a 43-in, bore, an outside diameter of 52 in. and a width of 3% in., carrying 76 tapered rolls. The smaller bearing has a bore of 16 in., an O.D. of 225% in., and a width of 3 in., with 38 rolls. Every roll was lapped and hand checked for accuracy, less than a quarter of a thousandth tolerance being permitted. Final inspection showed that the large bearing had been finished to the remarkable degree of 0.0015 in. in 52 in. and the smaller one to 0.001 in., and that the runout for both I.D. and O.D. in both bearings was equally exact, using gages of the highest precision.

All gages used in the manufacture and inspection of these bearings were of laboratory precision, even more accurate than Johansson gages, which are accepted as the highest standard for mechanical accuracy. Each master gage used was checked to theoretical standards, where measurements are made in terms of light waves. The ultimate in mechanical precision was demanded by Warner & Swasey, and was delivered by the Timken Roller Bearing Co.

All through the design and construction of this telescope mathematical accuracy and precision is essential. Slow motion must be true, quick motion rapid but under exact control. Keeping pace with the earth's rotation is in itself a delicate problem, but that pales in comparison with that of keeping pace with the stars in their transit through the heavens. Light rays from the stars are bent, or refracted, as they pass through the blanket of atmosphere which surrounds the earth. Consequently, as the star rises the angle of sight from the telescope varies with the thickness of the atmosphere.

Merely following the mathematical path of the stars would offer what would ordinarily be a sufficiency of problems. However, this motion must be constantly modified, and a "drag" applied to compensate for the thickness of the atmospheric blanket. This is a maximum at the horizon and a minimum at the zenith. Nevertheless, this intricate problem has been solved, and the solution worked into the telescope design in such a manner that it is fully automatic.

To discuss even in general terms the many fascinating phases of this new telescope would require a book. The timing mechanism and the gear trains, the preparation of the graduated circles which serve as siderial, or star, clocks, the magnetic clamps which make possible the rapid shifting of the telescope from one star to another, the fine adjusting mechanism, are each of intense interest to specialists. The electrical connections which control the motors and the movement of the many parts of this

huge telescope would take pages to describe.

Those interested in elevators would be intrigued by the movable platforms, the observing bridge which travels up and down the curve of the dome, and the "pulpits" where the observer can for the first time reach directly the prime observing point at the top of the telescope.

These many devices all play an important part in both the accuracy and the scientific value of the instrument as well as in the ease with which it can be handled and used more efficiently, yet not even the involved electrical mechanism is more important than the main bearings on which the motion of the major axes depend. The whole instrument is a masterpiece of mechanical efficiency and precision, worthy of the builder's name and of the accuracy and size of the 82-in. reflecting mirror around which it is being built.

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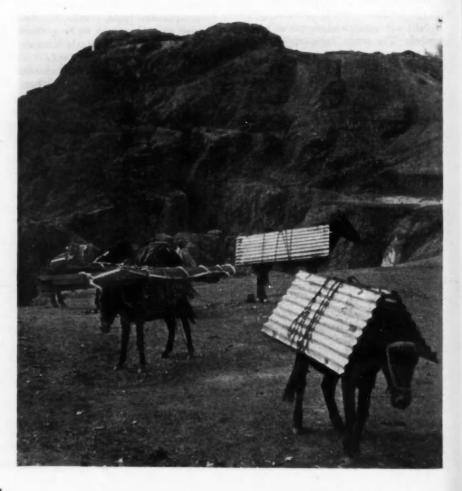
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THIS shows how "Calamina" or corrugated iron as we call it, is loaded on burros for transportation across the Andes. Each donkey carries his own roof.





New Wheel Foundry Growing Within Old One

RIFFIN WHEEL CO. is building a new wheel foundry on the site of the original plant which was constructed in 1890. In it will be incorporated the accumulated experience of that company over a period of almost 45 years during which time it has built foundries in various parts of the country, each unit having been in its day the "last word" in wheel foundry construction. This new development has three points of special interest; the contrast of constructional practices; the change of foundry equipment, notwithstanding that the old foundry was from time to time improved; and, the fact that the new structure is rising almost within the old and without interruption to production of chilled iron car wheels.

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This reconstruction work is now going forward at the Sacramento Square plant which is located on a 35-acre plot in Chicago. T. A. Griffin, the founder of the Griffin Wheel Co., moved to Chicago in 1886 and

A NEW foundry growing out of an old one is not a new story. But when the growth is taking place without interrupting production in the old plant, that is a story. And here it is.

in 1890 started the Sacramento plant which at that time had a capacity of 100 wheels a day. Output was soon increased to 300 wheels a day and by 1895 the capacity was 700 wheels. This unit eventually reached 1000 wheels a day which, together with the west foundry which stands on the same plot of ground and has an additional capacity of 400 wheels per day, constitutes the largest wheel foundry plant in the world.

That portion of the plant now being replaced consisted of three sections, each one served by a cupola. The building was in the form of a square measurng 300 ft. by 300 ft. The south section, now demolished measured 100 ft. by 300 ft. Its constructional features were whatever the carpenters of its building day de-



A jib crane served each floor. It was used to handle flasks and molten iron and to shake out molds.

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creed. Wooden posts, floors and roof trusses. This section, like the other two, was served by its individual cupola and it had a capacity of 350 wheels per day. The cupola stood at one end and iron moved in a straight

line to the molds and the wheels continued in the same line to the soaking pits beyond which was the cleaning room. The molding space was planned in 14 circular floors, each having a capacity of 25 wheels.

The only mechanical devices to be found in this o'd unit were air hoists at the molding floors and an overhead track for hand-operated trollevs.

Ladles, swung from this track,



A hook used to prevent the hand-wheel from turning was an approved safety device.

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were p When f various ing flo rail tra an airmolds v ing an ing in opening for del crane v iron ar for por cooled out. 7 to one ing pi formed tongs ley. shaken by har The fla the tr next m

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were pushed by hand to the cupola. When filled they were pushed to the various molding floors. Each molding floor consisted of a level tworail track centered under the arm of an air-operated jib crane. The 25 molds were made on this track, leaving an opening on one side for bringing in the molten iron. Another opening was left on the opposite side for delivering the wheels. The jib crane was used to carry the ladle of iron around to the desired molds and for pouring. After the wheels had cooled sufficiently they were shaken out. These red hot wheels were set to one side for removal to the soaking pits. This delivery was performed by hand by means of special tongs hung from an overhead trolley. After the wheels had been shaken out, the sand was reworked by hand and piled inside the track. The flasks having been replaced on the track were then ready for the next molding operation.

Before operations were stopped in this unit column footings had been located and concrete poured. Operations were transferred to the second unit and wreckers started to demolish the old structure. The contract for the structural steel was let on Oct. 6. Wrecking was started Oct. 22. The building 100 ft. by 300 ft. was inclosed by Nov. 30.

Continuous Molding

In the new unit there will be installed molding machines designed and built by the Griffin Wheel Co. This feature in itself is an innovation in a wheel foundry. Molds will travel on cars on a continuous elliptical track, being poured at a central pouring station. This conveyor will be timed so that a 40 min. cooling period will elapse between the time of pouring a mold and the time that mold, still on the conveyor, reaches the shake-out station, which will be adjacent to the soaking pits, in which the wheels will remain for two days, before being delivered to the cleaning

Electrical hoists will be used to remove molds from the conveyor to the shake-out which will be mechanically operated and specially ventilated. These hoists will return the empty flasks to the conveyor. Sand will be mechanically handled and prepared and distributed by an overhead conveyor to overhead bins at the molding stations. It was in this unit that an air furnace was recently installed as a supplement to the cupola (see The Iron Age, Sept. 27, 1934, page 13) thereby establishing the first



Who will reach the bull ladle first? Racing with wheels and small ladles by buggy men is strictly prohibited.

duplexing process for the manufacture of chilled iron wheels.

Capacity Increased

It is interesting to observe that the old unit had a capacity of 350 wheels a day. This new mechanized unit will be able to turn out 60 to 65 wheels an hour, or 1000 wheels in two eighthour shifts.

When this new unit is in operation, the second, or center unit, will be torn down and a new and modern structure will rise in its place for the manufacture of miscellaneous wheels other than A.R.A. standards. This second unit will be used to produce wheels for street car service, chilled castings (rolls and balls) for grind-

ing and pulverizing machines, and flask equipment for use on the No. 1, or mechanical unit. It will be served by a cupola and air furnace which can be used as a stand-by in case of interruption to melting operations in the first unit. Ordinarily the duplexing process will not be used for the character of work to be done in the second unit. Mechanization in these two new units will so increase the capacity of this foundry that when the third old unit is demolished it will not be replaced and the third cupola will be dismantled. When the second foundry unit is completed, reconstruction of the cleaning room structure and the building that encloses the cupolas will be started.

Propose Standards for Wire Reels and Spools

PROPOSED new standards for manufacturers and users of reels and spools for insulated wire and cable have been prepared by a committee of the Wire Association, 17 East Fortysecond Street, New York, and are now available to interested parties. The final report of the committee includes

tables of sizes adopted which are recommended to the industry. Frank Mossberg, Mossberg Pressed Steel Corpn., Attleboro, Mass., is president of the committee, and E. W. Clark, General Electric Co., Schenectady, N. Y., is vice-chairman and secretary.

Largest Single Steel-Frame House



The electric arc welds the framework into one single piece.

THE largest single steel-frame house thus far built, and one of the first of its type in which arc welded construction has been used throughout, is being erected in the Ottawa Hills residential section of Toledo, Ohio, for O. C. Rohde from designs prepared by Myron T. Hill, Toledo architect. Fireproof construction, greater stiffness and rigidity as well as higher speed of assembly, are all provided for by the design of the arc welded steel frame.

This 12-room residence has a total cubic content of 53,450 cu. ft. The spread of the house with connecting garage is about 83 ft., depth 35 ft.

The front door leads into a flagstone-paved vestibule, and up two steps into the main hall from which the living room, 15 ft. wide by 24 ft.



PLACING a welded panel which was delivered fully fabricated beforehand by arc welding and ready for welding in position. Only 45 panels were required in the entire wall frame of the house.

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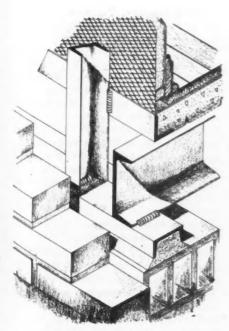
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Built by Arc Welding



Section through wall at first floor level, showing floor construction, welding and sill detail.

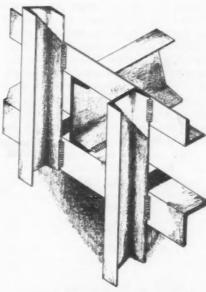
long, is reached through an arched opening. The dining room and study are also reached from the stair hall. A completely screened, flagstone-paved porch opens from the study. Between dining room and kitchen is a servery with sink and cupboards.

Four bedrooms and two bathrooms comprise the second floor of the house. The master bedroom, over the living room, is supplemented by a dressing alcove. Adjacent to the master bedroom and over the study is a guest bedroom, both rooms connected with the same bathroom. A similar arrangement is used with the daughter's room over the dining room and her guest bedroom over the kitchen. A sewing room located over the motor driveway acts as a connecting passage from the rear stair hall to the two-room servants' quarters over the three-car garage.

The basement of the house contains a recreation room and a completely

equipped owner's workshop. The boiler room, containing the heating and air-conditioning equipment, is only 10 ft. by 11 ft. An outside stairway provides easy access to the laundry.

The walls of the house are composed of large panels one story in height assembled by shop welding. These panels were fabricated from

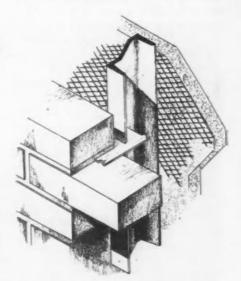


Detail of steel framing at second-floor level showing welding.

standard 3-in. 4.1-lb. channels as studs and angles, plates, etc., as necessary. A total of 45 panels were used in construction, the largest being 10 ft. by 20 ft. The first floor panels have a continuous 3-in. channel sill as base and a continuous girt angle at the top to receive the second floor channels. The second floor panels have a girt angle base which rests on top of the second floor channels. Top girt angles are 21/2 x 2 x 1/4 in. while bottom girt angles are 3 x 21/2 x 1/4 in. The channel studs of both panels overlap so that a field weld could be made to the opposite girt angle, giving a continuity of wall construction.

In erection of the house the first step was accurate placing of bearing plates and anchor bolts. All plates were brought into alinement and grouted solidly in place on the 12-in. load-bearing tile basement wall. A minimum of two bearing plates were placed under each panel. Wall panels were subsequently welded to all bearing plates.

The next step was to set the first-story wall panels in place and bolt them together at the panel intersections with ½-in. bolts which were used only for assembly. The first floor channels were next set in place, bearing directly on the 3-in. channels which acted as sills. Floor channels and wall panels were then alined, plumbed and welded. After the wall panels had been welded to the bearing plates, continuous grouting was placed



Typical wall section showing metal clip fastening brick veneer to frame.

under the channel sills to secure con-

The next step of erection was to place the second floor channels. The second floor wall panels were then bolted together at the panel intersections. The floor channels were welded to both first and second-story girt angles. Extending studs of the first story were welded to the second-story girt angles and the second floor studs were welded to the first-story angles. The second-story wall panels were then welded together and the third floor beams set, brought into alinement and welded.

A clear, unobstructed passage in the wall for all ducts, pipes, conduits, etc., was provided by placing all girt angles on the interior of the frame, except at the eave.

All welding, both in the shop and field, was done with the shielded arc process, using welding equipment manufactured by The Lincoln Electric Co., Cleveland. Quarter-inch fillet welds were used almost entirly. After welding, all welds as well as the steel were covered with aluminum paint.

Standard 6-in. 8.2-lb. channels spaced 3 ft. to 3 ft. 6 in. on centers carry the floor construction. A %-in. rib lath, which acts as a form for concrete and also as reinforcement, in the concrete floor slab, was secured to the top of the channels. Ceilings are metal lath and plaster, suspended immediately below the floor channels. The total depth of floor from ceiling to finished floor is 11 in.

The wall is faced with a 4-in. brick veneer. A 1-in. air space separates brick and steel. Three-inch channels, finished on the interior with metal lath and plaster, comprise the frame, giving a wall thickness of 9 in. The space between the brick veneer and the metal lath is filled with rock wool insulation.

Hard-burned common brick will be used to face the house. The front entrance is flanked either side by sandstone, which is also to be used in the chimney.

Loose angle lintels carry the brick veneer over all openings. Beams 8 in. and 10 in. in depth were used over the garage openings. Floor construction over the garage is carried on 8-in. 11.5-lb. channels. Brick veneering is fastened rigidly to each stud every seventh course of brick, providing mutual stiffening and lowering the stress on the channel studs to a unit stress of 12,800 lb. per sq. in.

A total of 15 tons of steel was used in construction of this residence. It was divided as follows: 46 per cent for the wall panels, 45.7 per cent for floors and 8.3 per cent for lintels, brick fasteners, etc.

Whereas former jobs of steel construction have figured as 8 to 10 per cent more than with wood, in this job the cost of steel construction is approximately the same as that of wood.

C. Merrill Barber, Cleveland, was the structural engineer. The house was erected by George Lathrop & Son, Toledo, Ohio, and all welding, both shop and field, was done by the Art Iron & Wire Works of Toledo. The steel was furnished by the Carnegie Steel Co.

In regard to the simplicity of erecting the framework of this house, Walter Lathrop, speaking for the contractors, stated that the only equipment used was an A-frame and a Lincoln welding machine.

Rebuilds Rotor with Laid-On Metal

N unusual job in reclaiming a high-pressure bronze rotor of a 30-in. Wheeler centrifugal pump was completed recently by the Arthur Tickle Engineering Works, Brooklyn. The rotor was in fairly good shape except for the blades which had been corroded almost to the point of complete disintegration. In fact some of the blades did not exist at all, and others were in skeleton form. The users got a quotation and found that a new rotor would cost them \$2,000, which sum they hesitated to invest. They approached the Arthur Tickle company on the subject of repairs and after investigation engineers of this company felt the job could be done by means of laid-on metal. The company was told to go ahead and all of the blades were rebuilt in this manner at a cost to the manufacturers of \$385.

The method was relatively simple. The contour of the back of a single blade was determined from parts of different blades which still remained reasonably intact. A form or mold was then made up of carbon paste and after this had been completed all old blades were cut out down to solid metal with a pneumatic

chipping hammer. The mold was then set in position for the building up of one new blade. An electric welding torch with a special bronze alloy wire was used. Contact was first secured at the solid metal at each end of the blade position and by applying successive layers against the carbon mold, first from one side and then from the other, the space was finally arched across and then built up to the desired thickness. In this way it was possible to approximate, in the thickness of the metal applied, the varying cross-section of the complete blade.

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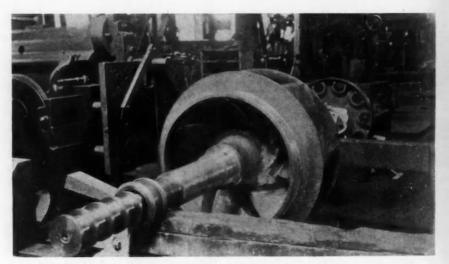
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All the full seven blades were built up one after another in this fashion, using a total of 90 lb. of the bronze alloy welding wire. After completing rough contours with the laid-on metal a portable grinding outfit was used to smooth down the surface and bring the blades into form closely resembling the original. The strength of the new blades is said to be fully equal to that of the original bronze casting, and their resistance to corrosion is much improved. The job was completed in 18 hr. working time with three men, and the rotor is now back in service. Its total weight is 3000 lb.



New blades for this 3000-lb. rotor were built up entirely of laid-on metal.

Pontiac Installs New Cylinder Block Machining Line

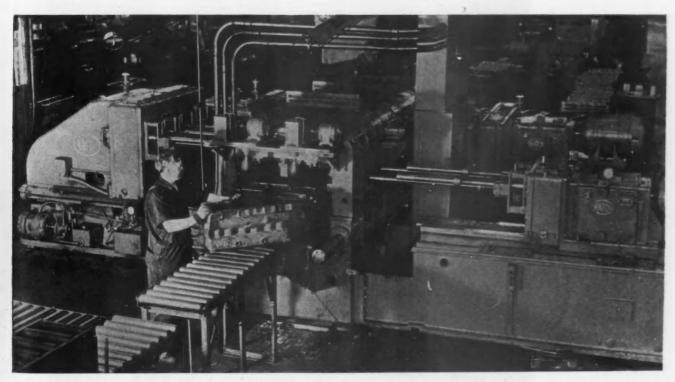
N the belief that the maximum popularity of the low-price, highquality car is still ahead, the Pontiac Motor Co. is producing in the coming year a six-cylinder car as a companion line to its series of straight eights. Preparing for the manufacture of the new six, Pontiac has expended more money for new tools and machinery than at any time since it first introduced a car in 1926. It has made this capital investment, according to H. J. Klingler, president and general manager, because it is convinced that the more modern and efficient an automobile plant is today, the better opportunity a manufac-

By BURNHAM FINNEY Detroit Editor, THE IRON AGE

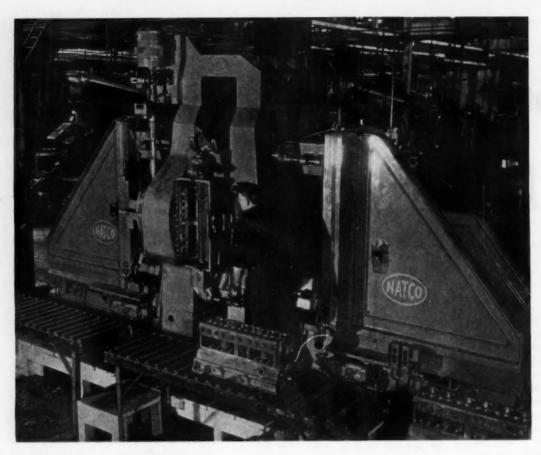
turer has of turning out the best quality car at the lowest price.

Not the least of the expenditures by Pontiac was in equipment for a complete new line for machining the cylinder block for the six. In the design and construction of this machinery are embodied the latest principles whereby low production costs can be secured and quality and precision of workmanship be maintained at the highest possible level. Mass production, in other words, has been achieved without sacrificing any of the qualities long associated with Pontiac workmanship. Multiple operations are performed on machines built up from standard units and equipped with special heads and fixtures. Some of the outstanding machines in the cylinder blockline, now in full production at the company's plant, are described in this article.

A two-way drilling machine, with two self-contained hydraulic units, is used for several operations. One unit is arranged in a vertical position and has a single-spindle cluster box. The



A number of operations are performed at a high production rate on this crank and cam boring machine. The view above shows the boring and chamfering heads and the unloading position.

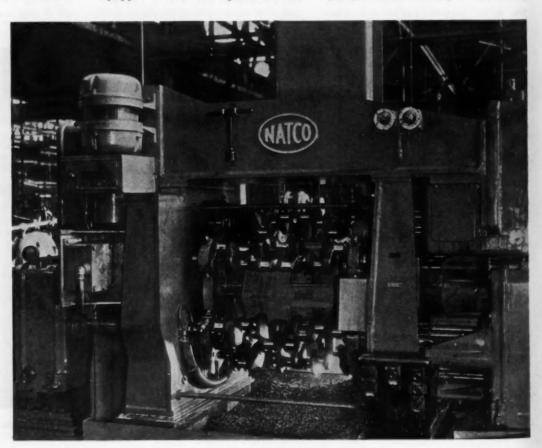


Two - way, four - head drilling and tapping machine, with automatic indexing fixture, for machining the oil pump and distributor shaft holes and pads on the cylinder block.

other unit is in an angular position with a four-spindle cluster box. The vertical head drills an oil release hole in the bottom of the block, and the angular head drills four oil lead holes on an angle from the main bearing.

A three-way machine, having three hydraulic units, is employed for multiple operations. The right-hand unit, equipped with a four-spindle cluster box, drills four oil gallery connecting holes to specified depth. The lower left-hand unit and the upper lefthand unit have two-spindle and single-spindle boxes respectively. The

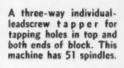
Two-way machine with automatic indexing fixture to drill, counterbore, chamfer, ream and tap both ends of the crankshaft

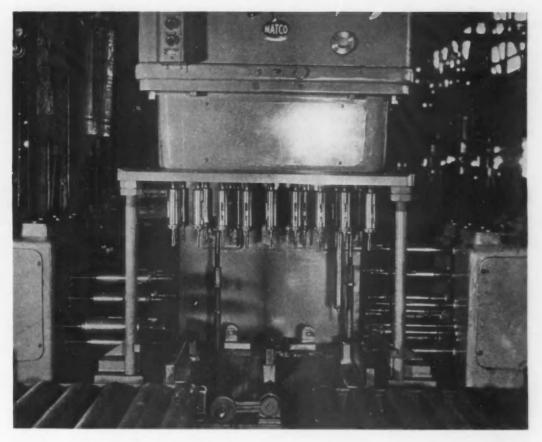


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A three leadscree tapping both end machine

upper l core-drill the oil s gage hol

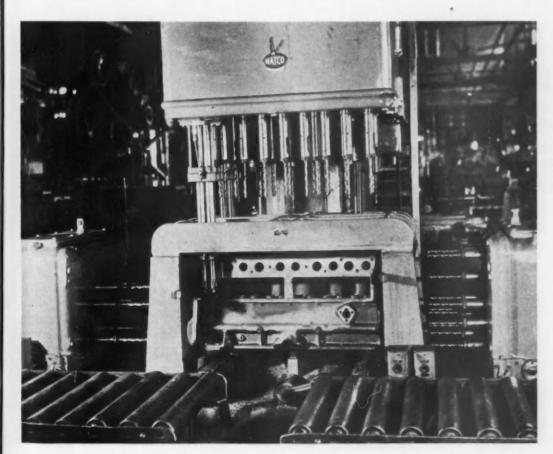




upper left-hand head combination core-drills, counterbores, and reams the oil filler hole and drills one oil gage hole. The lower left-hand head combination drills the 3-in. diameter of the oil suction hole.

Sixty-four holes are drilled in the block on a three-way hydraulic drill-

ing machine built up of one standard vertical hydraulic drilling unit, arranged with a fixed-center cluster box, and two self-contained hydraulic



Holes in the top and both ends of the cylinder block are drilled, countersunk and counterbored on this three-way machine equipped with 48 spindles. drilling units, also with fixed-center cluster boxes. The vertical head drills 42 holes in the bottom of the block, the right-hand head 19 holes in the manifold side and the left-hand head three holes in the water jacket side.

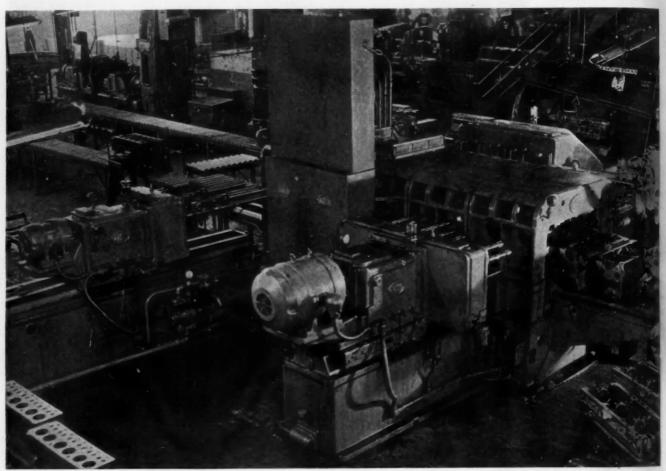
A machine similar in construction to the above three-way hydraulic drilling machine does the following work: Vertical head, countersink 38 holes; ream one and drill three holes, ing and boring machine made up of three self-contained hydraulic units and one special boring unit. All three hydraulic units have fixed-center boxes containing a total of 26 spindles, while the boring unit has a fixed-center box with eight spindles arranged with a floating drive and outboard bearing support. The machine cycle is as follows:

Position No. 1—Operator loads two blocks on fixture conveyor.

Position No. 4 — Right-hand head: Rough bore crankshaft bearing; and rough bore camshaft bearing.

Position No. 5 — Right-hand head: Semi-finish bore crankshaft bearings; and semi-finish bore camshaft bearing.

Position No. 6—Left-hand head: Chamfer both sides of center main bearings; and chamfer one side of all cam bearings.



Rear view of crank and cam boring machine showing loading position, left-hand core-drilling head, chamfering head, and panel boxes for electrical and hydraulic systems.

in bottom of block. Right-hand head, countersink 14 holes in manifold side and core drill one hole; chamfer four intake part openings. Left-hand head, finish counterbore two Welch plug holes in water jacket side and countersink one hole.

Arranged with one vertical, one right-hand and one left-hand head, a three-way leadscrew tapping machine taps a total of 61 holes in the block. Each head is complete with cluster box, leadscrew plate and individual leadscrew spindles.

Two-Way Machine Has Special Boring Unit

One of the most interesting machines is a two-way, four-head drillPosition No. 2—Left-hand head, front end of block: Core drill outer wall of crankshaft hole; core drill outer wall of camshaft hole, and end mill half hole for water pump. Right-hand head, rear end of block: Core drill outer wall of crankshaft hole; core drill outer wall of camshaft hole and counterbore; and combination drill and rough counterbore for Welch plug.

Position No. 3—Left-hand head: Core drill second boss in crankshaft hole, and core drill second boss in camshaft hole. Right-hand head: Core drill second boss in crankshaft hole; core drill second boss in camshaft hole; and finish counterbore for Welch plug. Position No. 7 — Unloading of blocks on roller conveyor.

The above machine has an indexing fixture hydraulically operated and electrically interlocked. Blocks are conveyed automatically down through the fixture from the loading station. The only manual work is the loading of the blocks. The machine ejects blocks automatically on to the conveyor line.

Drilling and Tapping Units Perform Several Operations

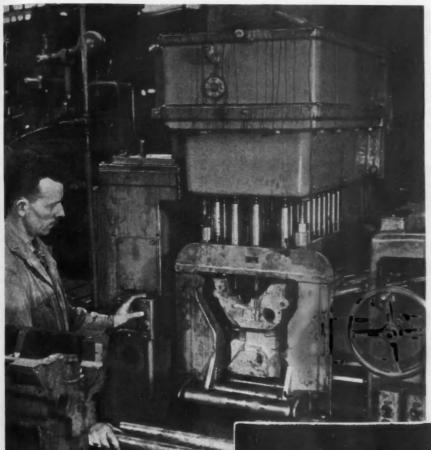
A large number of varied operations are performed on a two-way, four-head combination drilling and tapping machine. This machine has Holes in are tap vidual-l

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units and units, each one fixed special he right-han spindles spindles. operated driven ta complete individua box having sition true with an ism arra

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block in each position, is mounted on the fixture pedestal. Operations are as follows:

Position No. 1-Unload and reload one block.

Position No. 2—Left-hand head; Drill shaft hole; and drill two holes. Right-hand head: Drill shaft hole; and drill two holes.

Position No. 3—Left-hand head: Counterbore shaft hole; and countersink two holes. Right-hand head: Drill two holes; and chamfer two holes.

Position No. 4—Left-hand head: Tap two holes. Right-hand head: Tap two holes.

Position No. 5—Left-hand head: Ream shaft hole. Right-hand head: Ream shaft hole and face boss, using combination tool.

Three-Way Drilling and Tapping Machines Also Employed

A three-way hydraulic drilling machine similar to those already de-

ABOVE

Holes in bottom and both sides of block are tapped on this three-way individual-leadscrew tapping machine with 61 spindles.

AT RIGHT

This three-way machine is used to countersink holes in the bottom and manifold side of the block and to finish counterbore the Welch plug holes on the water jacket side. The machine operates 59 spindles.

right-hand and left-hand drilling units and tapping units. The drilling units, each of which is complete with one fixed-center cluster box, are of special heavy-duty construction. The right-hand cluster box contains eight spindles and the left-hand box seven spindles. The tapping heads are operated by a single reversing motor-driven tapping unit. Both heads are complete with leadscrew plate and individual leadscrew spindles, each box having two spindles. A five-position trunnion-type fixture, equipped with an automatic indexing mechanism arranged to hold one cylinder



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scribed has been installed for a number of operations. The vertical head drills 28 holes in the top of the block, the right-hand head 17 holes in the front of the block and the left-hand head nine holes in the rear end of the block. Another machine of this type is used for the following purposes: the vertical head spot faces four

head is complete with cluster box, leadscrew plate and individual leadscrew spindles.

Valve throat holes in the block are combination core-drilled and counter-bored on a standard drilling machine with a fixed-center cluster box having 12 spindles. A two-position fixture is arranged to hold one block in each

ing machine arranged with a 40-in, rail head equipped with 12 spindles. Bolted to the flange of the head is a special bearing assembly having six spindles. Six seats are machined per machine cycle, with two cycles required to perform the operations.

Multiple operations are performed on a standard drilling machine arranged with a fixed-center box with 24 spindles. Mounted on the machine base is a 44-in., two-position, hand-indexed rotating fixture. On top of this is a two-position fixture to hold one cylinder block in each position. The operations follow:

Position No. 1—Unload and load one cylinder block; and combination semi-finish bore valve throats and rough the valve seats.

Position No. 2 — Combination finish-bore valve throats and semi-finish valve seats.

The entire cylinder block line has been laid out so that the work moves from operation to operation on a roller conveyor, thus saving time and manual labor. Machines are so located that high production is obtained in a relatively small amount of floor space.

Two-Way Unit for Crankshaft Drilling and Tapping

Aside from the new line for machining the cylinder block, the crankshaft production line has a machine of uncommon interest for drilling, counterboring, chamfering, reaming and tapping both ends of the crankshaft. It is a two-way horizontal combination drilling and tapping machine equipped with a six-position, trunnion-type fixture suitable for holding a crankshaft in each position. The work is loaded and unloaded manually, but the cycle of the machine is automatic. The machine has left and right-hand drilling heads and left and right-hand tapping heads. The drilling heads are mounted on self-contained hydraulic feed units. One reversing motor drive tapping unit is provided with shaft connection to drive the heads from both sides. Heads for the drilling units are equipped with a total of 26 spindles mounted on fixed centers and with anti-friction bearings and nose adjustment where centers permit. The tapper boxes have seven fixedcenter spindle drives with leadscrew plates and seven individual leadscrew tapping spindles with leadscrew nuts and tap holders. The right-hand drilling unit is equipped with positive stop, automatic time delay reverse and two rates of speed.



Oil lead and oil release holes in the block are drilled on this two-way angular drilling machine.

holes, countersinks 25 holes and drills four holes in the top of the block; the right-hand head countersinks 14 holes in the front end of the block; and the left-hand head countersinks six holes in the rear end of the block. The vertical head contains 33 spindles, the right-hand head 14 spindles and the left-hand head six spindles.

To tap 28 holes in the top of the block, 16 holes in the front end and seven holes in the rear, a three-way tapping machine is employed. It is equipped with a vertical, head and left and right-hand heads. Each

position and is mounted on a 44-in. diameter hand-operated rotating table. Work is simultaneous on six holes in the loading position and six in the second position.

Bores Chamfered on Standard Drilling Machines

The top and bottom of the cylinder bores are chamfered on a standard drilling machine with a fixed-center box containing six spindles. Twelve valve spring seats are counterbored and countersunk on a standard drill-

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New Things in Materials and Processes

By EDWIN F. CONE

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THE question of the correct definition of an alloy steel is still unsettled. Here is one that recently appeared:

"An alloy steel may be defined in a general way as a steel containing an appreciable percentage of one or more elements (other than iron and carbon) conferring special virtues on the metal."

In commenting, the author of it suggests that the definition does not tell the whole story. To be worthy of the name, alloy steel, he holds, must necessarily be of a higher quality and better made than a similar straight carbon steel; otherwise a large part of the advantage gained by the alloy addition is lost. It is probable, it is further argued, that, "were it possible to remove the alloy from the steel after its manufacture, the alloy steel would still be superior to ordinary steel simply on account of the additional precautions taken." If these views were thrown open to debate, some decidedly adverse opinions would doubtless be forthcoming.

In elaboration of the subject, the proponent further states that this extra quality is one reason for the additional cost of alloy steels; that if the price per pound of alloy steel is analyzed, it will be found that the alloy addition alone is not sufficient to account for the extra cost. The following example is cited:

A 3.50 per cent nickel steel is currently quoted in bar form at 4 cents a pound while carbon steel bars are a little under 2 cents. The nickel addition alone, even at 35 cents a pound for the nickel, accounts for not quite 1.25 cents. Therefore, about ¾ cent, or a little less than the cost of the alloy, goes for the "quality factor." Although this may seem out of all proportion, "it is not unfair for the steel manufacturer to make such a charge, providing the steel is really of good quality."

High-Frequency Furnace for Rare Metal Alloying

NE of the important advantages demonstrated as belonging to the Ajax high-frequency furnace is its success in producing certain special alloys of an unusual nature. A company which specializes in high-grade, high-cost alloys finds that this furnace is the only one in the line of production today which can produce alloyed products now demanded for highly specialized uses, products which carry elements which will not go into true solution. These elements are those recognized as the very readily oxidizable, rarer ones. Alloys into which such elements must be incorporated can be handled successfully and expeditiously by this melting medium.

More Stainless Steel in Airplanes

F the results of a canvass recently of airplane builders on the Pacific Coast, made by a representative of a producer of stainless steel, are reliable, this product and other alloy steels will be used to an increasing extent in airplane construction within a few years. As speeds increase and as the size of planes expands, a material is more and more demanded which will have high strength and resistance to stress and fatigue as well as possessing lightness in weight. As better production methods and new products slowly appear in stainless steels, the probability of their more extended application in airplanes increases.

To X-Ray Steel Over 4 In. Thick

AT a recent meeting of one of the local sections of a large technical society, an authority on the X-ray testing of metals stated that 3½ in. of thickness is probably the limit of successful non-destructive examination of steel sections by this method. While steel 4 in. thick can be pene-

trated, the definiteness of the picture is not entirely satisfactory. It was also stated that the General Electric Co. has developed special equipment, the use of which is hoped and expected to make X-ray examination of steel, 4 to 4½ in. thick, practical and reliable for detecting defects.

Another Field for the Electric Current

FRAUGHT with special interest and prophetic in nature is the following quotation from the Joseph W. Richards memorial lecture delivered by Walter S. Landis, vice-president, American Cyanamid Co., New York, at a recent convention of the Electrochemical Society:

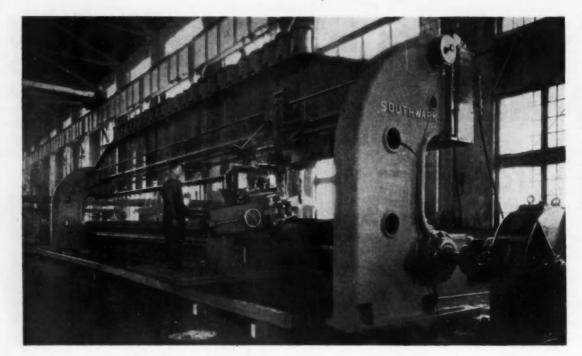
"While the electrochemical world has become very thoroughly educated in the skillful handling of this form of energy (electric) for the production of metallurgical and allied products, there is still another field of probably quite comparable importance where the electric current has made comparatively little headway. I speak of the great field of organic chemistry. We are still carrying out oxidations and reductions by the crudest of chemical means. We have before us the great problem of a better chemical utilization of that great storehouse of organic raw materials in natural gas and petroleum. It seems to me to offer the greatest opportunity to a new educator in the fundamentals of a new synthetic chemistry in which electric energy is bound to play an important part sooner or later. I realize that this is a difficult field, largely because some of the products form our cheapest fuels and, therefore, we immediately run against a most serious competition between the two forms of energy, where heat units are alone in compe-

Molybdenum in Steel Rails

AN interesting development in steel rails is the trial use by one of the leading American railroads of rails containing molybdenum. A percentage of 0.30 to 0.40 molybdenum is understood to bestow special wear resistant and other desirable properties.

Leaded Bronze Stock

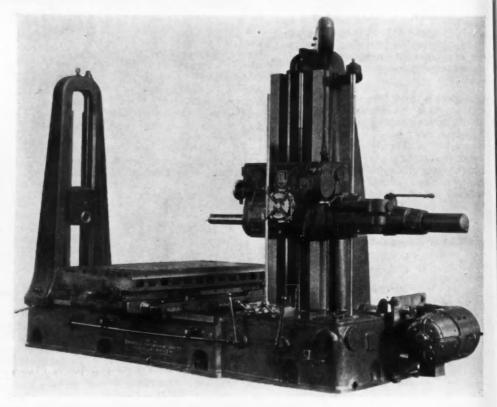
PERMITE leaded bronze bearing stock in bar lengths up to 6 ft. are now available to industry for the first time through the exclusive distributorship of Joseph T. Ryerson & Son, Inc. These longer lengths make possible the speed production of bearings and bushings on a lathe or screw machine. And the Permite bronze bar stock has the additional advantages of free machinability and an exclusive turned finish that permits positive chucking.



THIS plate planer. travels the operator's platform along with the head in making a 4.7-in. edge cut, 36 ft. in length Stock is removed in both travel directions. A description is given on page 27.

AT RIGHT

MAIN spindle and a highspeed spindle are provided in the design of this horizontal boring and drilling machine. The construction anticipates the use of cemented carbide tools. The controls are directional for the simplification of operation. The rotary selector is equipped with a direct reading dial. Other details are outlined on page 26.

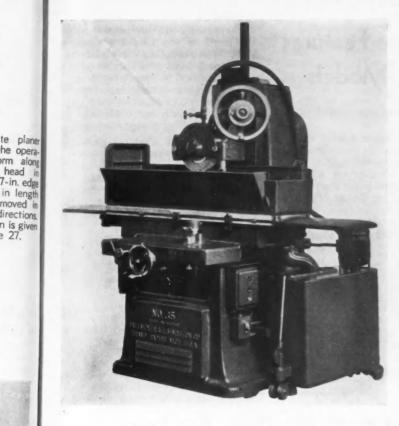




AT LEFT

NFORMATION as to the welding of machine bases, fabricated from plates, is given on page 27.

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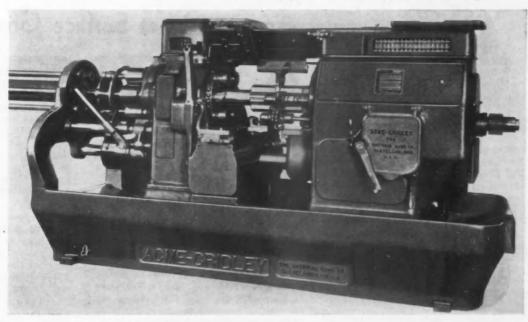


ABOVE AND BELOW

THE standardization of parts, even to frame members, as between different models of automatic screw machines, marks an effort to reduce investment necessary in obtaining complete equipment. This new model is covered on page 26.

ABOVE

MECHANISMS to facilitate set-up are featured in the design of this surface grinder which is referred to on page 26.



BELOW

A LINE of motorized speed reducers which provides for almost any mounting or power take-off has three of its members pictured here; the full line is referred to in the text on page 27.







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New Automatic Screw Machine Features Interchangeability as Between Models

NEW line, Model R, of sixspindle automatic screw machines, supplementary to the four-spindle line, which was described in THE IRON AGE, May 3, 1934, and having the same frame members, is announced by the National Acme Co., Cleveland, and is pictured on page 25. Sizes 9/16 in., 1 in., 11/4 in. and These machines feature the standardization of parts to an extent permitting a very considerable interchangeability of parts, tools, collets, pushers and attachments, between the four and six-spindle models. This feature provides not only for the convenient operation of both four and six-spindle machines in one group or battery of machines, but also aims toward a reduced capital investment necessary to acquire the most complete equipment for each unit ma-

The spindle carrier has three-point support, as in the four-spindle model, and has large bearing surfaces, as pictured in the insert on page 25. The spindles, as well as all shafts rotating at over 20 r.p.m., are equipped with anti-friction bearings. The carrier unit assembly, in conjunction with the accuracies called for in manufacture and assembly, is said to afford extreme rigidity under heavy forming cuts and to eliminate vibration due to stock whipping.

The spacing of the spindles in the carrier is a factor providing latitude in the selection of forming or side tool devices and in tooling procedure. The two top and the two bottom spindles are in line for direct application of tooling from the four heavy and independently operated cross slides. The two side spindles, second and fifth positions, are available for a "short-coupled," double-deck tool holder or for an independent cross-slide tooling. The open design provides ample space in which to get at tools for adjustments, removal, etc.

The stock stop, or gage stop, is operated by an inclosed mechanism and is regularly employed in the sixth position. After stock feeding and collet closing the stop drops out of the way and the position is available for the use of tools. When desired, the stock stop can be operated in the first position. The indexing of the stock-reel provides against torsional strain. The front disk of the reel turns in a reel guide which is mounted directly on the end of the frame and pan. The indexing power is through shaft and gear from the spindle carrier mechanism. This completes a well-tied unit for steadied rotative movement and for overcoming any tendency of bar stock to whip. The stock tubes revolve with the stock and are mounted on anti-friction bearings.

A new design finger holder, shown in insert on page 25, is utilized in opening and closing the collets. The fingers themselves slide on a hardened cam within the outer steel shell; both the fingers and the shell rotate with the spindle for the reduction of finger wear. Centrifugal force does not affect the action of the fingers as they are inclosed within the steel shell.

To gain correct relative surface speeds in forming and drilling, high-speed drilling attachments can be used in any or all of the six end positions. These are driven directly from the center gear mounted on the end of the spindle carrier stem. Only one drive is required from the gear box to this spindle gear.

Threading is accomplished in either the third or the fourth position or both. The threading slide and operating mechanism can also be used in either position for accelerated reaming or turning operations. The two slides are independent of each other and of the main tool slide and are each operated by a separate cam.

The system of machine lubrication for all moving parts is the same as that used on the four-spindle models. The oiler automatically stops and starts with the operation of the machine. There is a separate sight-feed oiler to each oil tube. No attention by the operator is required.

The coolant system involves National Acme practice and a large chip space. Chips are removed at either end of the pan while the machine is in operation.

All castings are normalized before machining. Gears are alloy steel, rough cut, heat treated and then recut to accurate form and size. Highspeed and heavy-load gears are helical.

Easy Dial Feed Readings Facilitate Accurate Wet Surface Grinding

PATENTED dial reading device, on which tenths of a thousandth graduations are spaced over 1/8 in. apart, and the readings are on the pointer, giving a vernier effect, all to facilitate accurate grinding adjustments, is embodied in the operation of a new hydraulic feed, wet surface grinder, No. 35, brought out by Gallmeyer & Livingston Co., Grand Rapids, Mich., and illustrated on page 25. The machine is built around an integral column and base casting weighing in excess of 1500 lb.; vertical head-ways and cross saddle-ways are thus tied in the interest of alinement and rigidity. The self-contained motor driven unit is made up of the following standard equipment: Two motors, one mounted in the base for driving the hydraulic mechanism, the second attached to an adjustable bracket, mounted on the head, for driving the grinding wheel spindle using tex-rope drive.

The spindle head is of heavy design, accurately mounted, and provides for a minimum of grinding wheel overlap. The spindle is carried on pre-loaded ball bearings. Two spindle speeds are available. The higher for the use of wheels which have been worn down to 7 in. or 8 in. in diameter from their original 10-in. diameter. The working surface of the table is 8 in. by 24 in. Hydraulic longitudinal movement is 26 in.; transverse is $9\frac{1}{2}$ in. These ranges permit the operator to cover the work-

ing surface with a 10-in. by 1-in. wheel, which is standard equipment. Maximum longitudinal table speed in excess of 100 ft. per min. is provided and is instantly variable. Hand-wheel speed control and start and stop lever are conveniently located close together. The cross-feed is automatic, adjustable, and can be set to feed either in or out as desired, and can be operative at each reversal of the reciprocating table or at one end of the stroke.

The machine is equipped with a Vickers pump. High-pressure flexible hose is eliminated. Single-shot lubrication feeds all bearings except those of the spindle. A self-contained portable coolant system is used and is well shown in the illustration on page 25. The net weight is approximately 4000 lb.

Horizontal Boring, Drilling And Milling Machine

A NEW series 30 horizontal boring, drilling and milling machines is announced by Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. The design gives consideration to the increasing use of carbide cutting tools. A wide selection of feeds and speeds is offered; strength and massiveness of heavy duty machine elements are featured in design. See page 24.

To provide for a wide range of large and small work, with necessary speed spind a spe millin main 500 ping sensi be r r.p.m

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mair nitri trea spee spin speed range and sensitiveness, two spindles are used, each for use within a specified range. Boring and heavy milling are performed with the large main spindle running at speeds up to 500 r.p.m. High-speed drilling, tapping and milling feature use of the sensitive high-speed spindle which can be reversed at speeds up to 1500 r.p.m.

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Controls are conveniently arranged and are "directional," that is the units will travel in the direction indicated by the levers in thrown position. A separate feed unit is built into the base and is operated by a "rotary selector" which is equipped with a direct reading dial. The 18 milling feeds read in in. per min. and the spindle feeds read in 1/1000ths per revolution of spindle. All units are independently started, stopped and reversed, singly or simultaneously.

Safety trips limit all travel movements. For production milling, adjustable stops are provided for the table cross feed and the vertical travel of the headstock. Hand rotation of the turnstile rapid-traverses either the main or high-speed spindle. Turnstile handles engage or disengage the power feeds. In operation, the dial ring is set for desired depth and actuates a tripping device which automatically disengages the feed at any point within a 6 in. stroke.

The feed selector lever has two positions, the one for the main spindle and the other for the high-speed spindle. By cranking the selective levers either forward or backward nine changes of speeds, or feeds, are obtained; a single back gear, for the feeds, doubles the number obtainable, giving 18 independent feeds to each spindle speed. Two sets of back gears in conjunction with the speed selector provide 36 separate spindle speeds. The 36 speeds and 18 feeds are available for both main and high-speed spindles with a suitable range for each. All dials are direct reading. The table and the headstock movements are each provided with a precision scale. The verniers are graduated in thousandths and are adjustably positionable to permit setting to the nearest full inch for a starting point, thus eliminating much decimal figur-

Other specifications are: rapid traverse—120 in.; unit construction; headstock gibbed to both of the column ways; box-type table with stop holes; automatic lubrication; antifriction bearings throughout; splined shafts. Cooling compound tank is cast integral with bed.

Material specifications are: beds, columns, tables, saddles, etc., high grade, close grain alloyed cast iron; main spindle and spindle bushings, nitrided; main spindle sleeve, heattreated nickel alloy forging; high-speed spindle, nitrided; high-speed spindle sleeve, hardened and ground

alloy steel; gears, alloy steel forgings, hardened; short spline shafts, alloy steel heat treated; screws and long spline shafts, turned and ground high-carbon steel bars.

The following special equipment is available: extended saddle, saddle supports and auxiliary runways; precision lead screw attachment; micrometer measuring device; rotary tables; pump and piping; pick-off gears for changing spindle feed ratio; auxiliary tables; star feed facing heads; boring bars and bushings; vertical and other milling attachments, heads and cutters.

Motorized Speed Reducers For Wide Range of Application

NVERTED, horizontal and vertical types of motorized speed reducers, shown on page 25, are included in a series of five types manufactured by the Boston Gear Works, Inc., North Quincy, Mass.

In addition to the reducers shown, the series includes a parallel shaft reducer, a second reducer of horizontal type and a second reducer of vertical type.

The inverted reducer, I.M.A., has a single reduction, right-angle gear drive. The worm is hardened steel, ground and polished; mountings are anti-friction; the worm gear is phosphor bronze. Patented oil-seals prevent leakage; oil drain and oil level plugs are provided; splash-proof motors are used. The shaft may project from either or both sides. The motor may be 1/6, ¼, or 1/3 hp., alternating or direct current. Standard ratios are from 3¾ to 1 up to 48 to 1. Torque capacities up to 263 lb. in. Designed to run continuously at rated capacity.

Type C.M.A. has a compound reduction, right-angle gear drive. The first reduction is by right angle worm and worm-gear drive; the second by a series of spur gears. The shaft may project from either side, giving two different speeds of the driven shaft. Anti-friction bearings, patented oil-seals, drain and oil-level plugs are specified, as is also 1/6 hp., direct or alternating current, splash-proof motor. Standard ratios are up to 5000 to 1. Torque capacities up to 1500 lb. in. Continuous operation at capacity rating.

Type V.M.A. single reduction rightangle worm, hardened, ground and polished, running with phosphor bronze worm-gear. The shaft may project from above the housing or in both directions. Anti-friction bearings, patented oil-seals, drain and oillevel plugs, anti-splash motors are listed. Motor ¼ or 1/3 hp., alternating or direct current. Ratios 3¾ to 1 up to 48 to 1. Torque capacity up to 263 lb. in.

Machine Bases Made Of Welded Steel

THE welded steel machine bases shown in the illustration on page 24, were made by Walter J. Thomas & Co., Detroit, in its welding laboratories. By the use of flame shapecutting and arc welding the company fabricates machine bases which weigh approximately 30 per cent less than cast iron bases. After the welding process is completed, the work is normalized to relieve any stresses arising from the welding and is sand blasted. Because of the elimination of patterns and the process employed, the company claims substantial cost reductions. In forming the bases of machines from flat sheet or plate stock, the company utilizes a 31-ton press brake which is capable of handling steel 1/2 in. thick and 10 ft.

Plate Planer For Heavy Cuts In Both Directions

A NEW sheet plate planer with a capacity sufficient to plane the 4.7 in. thick edge of a plate 36 ft. long, and cut an 18-in. scarf on the edge of the plate, is announced by the Southwark Division of the Baldwin-Southwark Corpn., Philadelphia.

Cuts are made in both travel directions at a speed variable from 15 ft. to 45 ft. per min. The operator works from a platform which travels with the head. Tool feed is variable from 1/128 in. to 1 in. per cut. A maximum vertical tool adjustment of 10½ in. and a maximum horizontal tool adjustment of 24 in. are provided. The drive screw, roller-bearing mounted, is 7 in. in diam. by 58 ft. long; the thread is quintuple. The hold-down grip and clamp features 120 tons of pressure. A 50 hp. motor is used. Page 24.



Conference Board Reports on Probable Results of 30-hr. Week in Industry

THE National Industrial Conference Board has estimated that an average 30-hr. week, on the basis of September, 1934, production, would increase employment in manufacturing industry by 11 per cent or by approximately 700,000 workers. The board's analysis shows that the proposed reduction of hours by law would probably produce for workers and employers the following results:

For the employed workers, reduced hours, increased hourly earnings, stationary money income per week, and increased cost of living.

For the manufacturers, smaller output per man-hr., increase in labor cost per man-hr., and a larger increase in labor cost per unit of product.

In September, 1934, 6,352,000 wage-earners in manufacturing industries averaging 33.3 hr. per week, furnished 211,518,000 man-hr. in manufacturing production each week. To furnish the same number of manhours with an average 30-hr. week per worker would have required a working force of 7,051,000, that is 699,000 or 11 per cent more than were actually employed.

While the increase in employment arising from the establishment of an average 30-hr. week can be shown with approximate accuracy, it is difficult to indicate the full increase of employment that would result from a maximum 30-hr. week.

In an establishment in which there was at all times a steady flow of work the average might possibly coincide with the maximum. However, if the rule to be adopted should take the form that no worker, under any circumstances, should work more than 30 hr., it would be found that in many, probably most, companies and in manufacturing industry as a whole, the average hours per week would fall distinctly below the maximum.

Only experience could tell how great the gap would be. If the average should be 28 hr. a week it would have required about 7,554,000 wage-earners to do the work performed in September, 1934. This would mean an increase of about 1,202,000, or 19 per cent over those actually employed.

Effects on Workers' Pay

The wage-earners employed in September, 1934, received \$117,887,000 for a week's work or 55.7c. per hr. Under the average 30-hr. week these workers would give 190,560,000 manhours of labor, and, it is proposed, receive the same sum per week, and thus be paid at the rate of 61.9c. per hr. There would be an increase of employment of 699,000 workers who would render 20,970,000 man-hr. per week. Payrolls would not increase in the same proportion as workers since the newcomers would on the average receive less per hour than the seasoned employees.

How much less the rate would be cannot be accurately determined, but if these new workers were to be paid about 80 per cent of the rate for the experienced employees, say 50c., they would require a total payment of \$10,485,000. If this sum be added to the previous payroll the total would be \$128,372,000. The average rate per hr. for all workers old and new would therefore be 60.7c. The advance in total payrolls and in the average rate per hour would be about 9 per cent.

Labor Costs and Increased Prices

The increase of labor costs per unit of product under an average 30-hr. week would be parallel to that of labor costs per man-hr. provided output per man-hr. were unchanged. The addition of new, inexperienced workers, and the less efficient operation of the plant would probably decrease, in the first instance, the output per man-hr. and hence the labor cost per unit of

product would increase more than the labor cost per man-hr.

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How far these increased labor costs would affect total costs of production would depend largely on the part that labor expense plays in the output of any given industry. When much labor is expended on comparatively cheap materials the increased costs would be considerable; when little labor is expended on comparatively costly materials the increase in total production costs might be negligible.

The conference board's analysis pointed out that the manufacturer is buyer as well as seller. What he pays for materials and supplies is as much a part of his costs as what he pays for labor. With a universal 30-hr. week he would, no doubt, pay more for many materials and supplies than he has done heretofore. Thus the 30-hr. week will find its reflection in various items of increased costs.

The manufacturer as seller will no doubt indemnify himself for his own higher costs by charging higher prices for his product wherever this is possible. It is probable that for a time, and until the necessary price adjustments have been made, the manufacturer may himself bear the burden of increased costs. The ultimate effect of increased costs, however, would be increased prices.

For the worker, current proposals contemplate such an increase of hourly rates as will keep the weekly pay envelope at the same point. The employed worker is to get more leisure and to keep the same money income. When, however, the general advance in labor costs had raised prices all along the line, he would find that his money would buy less goods; that his real wages had declined.

November Construction Awards Decline

CONSTRUCTION award figures for November exhibited a decline, both as contrasted with data for October and with the figures for November of last year, according to F. W. Dodge Corpn. Losses from the previous

month were noted in each of the four principal classes of construction.

The loss in residential building is more discouraging because it occurred in that phase of construction where FHA aid has been chiefly centered. Declines in contracts from the data of a year ago were shown in residential buildings and public works of such size as to more than entirely offset the gains reported in non-residential buildings and public utility types.

The November construction contract total, all classes, amounting to \$111,740,800 in the 37 eastern States, was more than 30 per cent behind the volume of \$162,340,600 reported for November, 1933, and compares with \$135,224,800 for October of this year.

For the elapsed 11 months of 1934 contracts for construction, all types, totaled \$1,450,426,900 in the 37 States, as compared with \$1,048,498,900 for the corresponding months of 1933. Cumulative increases over 1933 were shown for each major construction classification.

Find New Excuse To Oppose Truce

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THE American Federation of Labor has found a new excuse for opposing an industrial truce in the iron and steel industry. Following the White House conference last week between union leaders and steel officials, Michael F. Tighe, president of the Amalgamated Association of Iron, Steel and Tin Workers, explained to the press that any proposal for a truce would have to be submitted in a referendum to the members of his union. Since the terms of the truce proposed had been known to him for many weeks, the comment was made by disinterested observers that it was rather late for him to enter a conference without sufficient authority.

Now, however, union leaders have found another reason to obstruct a They have circularized retruce. ports to the effect that steel companies are attempting to federate "company" unions on a national basis and that such a move disturbs the status quo. While it is true that in one or two districts, among them the Calumet district near Chicago, employee representatives of different companies have met together informally, they have done this on their own initiative and without any encouragement from steel company executives. As a matter of fact, there is a sharp division of opinion among steel company heads as to the necessity and desirability of a national federation of employee representative organizations. However, they have no control over the repre-sentative bodies, which are free agents and can move in the direction of federation if they so choose.

Mesta Machine Pays Christmas Bonus

DIRECTORS of Mesta Machine Co., West Homestead, Pa., manufacturer of machinery for steel mills, paid a Christmas bonus to salaried employees. All present employees who were on the salary lists at the beginning of this year received the equivalent of one month's salary, while those who have joined the company since Jan. 1 received an amount porportionate to their length of service.

During the year stockholders of the company have received a 66 2/3 per cent stock dividend and have benefited from two increases in cash dividends.

Sheet Sales Were Much Higher in November

SALES, production and shipments in November were sharply higher than those in October, according to the report of the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. In this survey, which is based on figures covering a monthly capacity of 325,000 tons, or approximately 59 per cent of the country's total capacity of 550,000 net tons, makers reported sales of 133,344 tons in November, compared with 102,920 tons in October; production of 143,057 tons against 104,898 tons, and shipments of 108,880 tons contrasted with 95,107 tons. Unfilled tonnage on Dec. 1 totaled 100,745 tons, or 31.0 per cent of capacity, compared with 77,423 tons, or 23.8 per cent of capacity on Nov. 1. The November report with comparisons of the two preceding months, in net tons, follows:

	Nov.	Oct.	Sept.
Sales	133,344	102,920	77,063
Production	143,057	104,898	76,051
Shipments	108,880	95,107	73,260
Unfilled orders	100,745	77,423	67,062
Unshipped orders	42,150	38,597	35,490
Unsold stocks	65,400	63,667	64,398
Capacity per month	550,000	550,000	550,000
Percentage reporting	59.0	59.0	59.0
rercentage reporting	99.0	99.0	99.0
Percentages, Bas			
Percentages, Bas			
Percentages, Bas Sales	sed on	Capacity 31.7	
Percentages, Bas Sales Production	sed on 41.0	Capacity 31.7 32.3	23.7
Percentages, Bas Sales	sed on 41.0 44.0	31.7 32.3 29.3	23.7 23.4
Percentages, Bas Sales Production	sed on 41.0 44.0 33.5	31.7 32.3 29.3 23.8	23.7 23.4 22.6

Editor's Note: This is a series of observations which, strangely enough, are exactly what they purport to be. In other words, they come from the daily diary of a real boss; a prominent executive in the metal-working industry who prefers to remain an anonymous author.

The Boss's Diary

Christmas! What business has a supposedly hard boiled executive with a thing like Christmas? Well, for one of that over maligned class of creatures, I like Christmas. I like to watch the scurrying around of the overloaded postmen weighted down with their myriads of greetings, presents and what not. I like the lull in the daily drive for business, for economy, for profit making. I like to see my fellows fired with an urge to let loose on what they can do for somebody else. I like the Christmas sparkle that replaces the avariecious glint in the eyes of people who would be intensely human. I like Santa Claus. I hold that, being the creature of our imagination, he comes nearer to being real than we ourselves.

I like to think that the advent of a Babe in the lowest surroundings of human poverty could continue to influence the whole world repeatedly for centuries. Somehow my faith and confidence in those creatures called Human Beings goes up by leaps and bounds when I think that they have room for Christmas in their hearts.

... PERSONALS ...

CARL C. GIBBS has been elected president of the National Malleable & Steel Castings Co., Cleveland, succeeding HENRY F. POPE, who has become chairman of the board after 50 years of service with the company, during the last 21 years of which he has been president. Mr. Gibbs became connected with the company in 1905 as a salesman for the Indianapolis plant. He was transferred to Cleveland in 1919 as sales manager for the Cleveland plant and a year later returned to Indianapolis as manager of the plant in that city. He remained in that capacity until five years ago when he became assistant to the president at the main office in Cleveland.

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ROBERT F. McCLOSKEY has been appointed a director and vice-president in charge of operations of the Blaw-Knox Co. plants at Blawnox, Pa., to fill the vacancy caused recently by the death of Wayne Rawley. Mr. Mc-Closkey previously was general superintendent of the company's Blawnox shops. He has been associated with the company since 1920, starting as manager of the plant then located at Sharon, Pa. In 1922 he was made production manager of shops at Blawnox, and in 1931 became general superintendent.

F. A. HANSEN, formerly general manager for the Hevi Duty Electric Co., Milwaukee, has become associated with the Lindberg Steel Treating Co., Chicago, where he will have charge of engineering and production of the new Lindberg control instruments. Prior to Mr. Hansen's association with the Hevi Duty company he was with the Westinghouse Electric & Mfg. Co., the General Electric Co., and the Bell Telephone System.

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HAROLD S. ARNOLD, since 1929 manager of the production department of the International Nickel Co., New York, has been promoted to the position of technical assistant to the vice-president. A. J. HANLON succeeds to Mr. Arnold's former position. Both men are veterans in the organization, Mr. Arnold having joined the company in 1914 and Mr. Hanlon two years later.

WALTER COLPITTS, of the engineering firm of Coverdale & Colpitts, New York, has been elected a director of the Edward G. Budd Mfg. Co. and a member of the executive committee.

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PAUL W. GREGORY has been appointed general manager of the Canton Culvert Co., Canton, Ohio, subsidiary of Republic Steel Corpn. He suc-

ceeds F. A. KELLY, who was recently appointed president of the Toncan Culvert Manufacturers Association, Youngstown, and head of Republic's culvert division. For the past 15 years Mr. Gregory has been associated with the Wheeling Corrugating Co., division of Wheeling Steel Corpn., at Wheeling, W. Va. He was head of the culvert department of that firm.

. . .

STILLMAN W. WHEELOCK, since 1922 manager of sales at St. Louis, for the Carnegie Steel Co., Illinois Steel and Tennessee Coal, Iron and Railroad Co., will retire on Dec. 31, after 40 years of service as a salesman in the steel industry. He became identified with the Illinois Steel Co. as sales agent at Denver in 1899. Three years later he was made assistant to the sales manager at Denver for Illinois, Carnegie and the Tennessee com-

panies. He became assistant manager of sales for the latter companies at St. Louis in 1907 and manager of sales at New Orleans in 1914.

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E. R. Jefferson, 332 South Warren Street, Syracuse, N. Y., has been named agent for all Babcock & Wilcox refractories in central and central-western New York State.

Tax Reduction on Iron Ore Is Denied

The Minnesota tax commission has denied Lake Superior iron ore producers an 18 per cent reduction in the \$200,000,000 valuation for 1934 on their properties in St. Louis County. The mining companies recently won an 18 per cent reduction on delinquent taxes for 1932 but the commission refused to apply this to 1934 pending a decision by the State Supreme Court.

British Steel Makers Look Ahead Hopefully

ONDON, ENGLAND, Dec. 24 (By Cable).—Steel makers are facing the new year with confidence, in spite of the holiday lull, and with good advance orders in hand.

Substantial government orders are anticipated in view of the promised subsidies for bridge and steamship building, and also in connection with the naval construction program. The motor and engineering trades are busier, and increased railway receipts are likely to result in substantial contracts for track and rolling stock.

British iron and steel output for 1934 is estimated at 6,000,000 tons of pig iron and 8,700,000 tons of ingots. Imports are estimated at 1,350,000 tons and exports at 2,260,000 tons.

Domestic tin plate buying is more pronounced, with purchases running well into 1935. Export inquiry is good, but with little actual business.

Continental iron and steel demand is quiet, owing to the holidays. There has been better business recently with Argentina and the Far East, notably with Japan. The International Raw Steel Cartel has reduced steel bar prices for India by 5s. gold and beams by 1s. 6d. gold. The latter price, however, lacks official confirmation.

International Rail Makers' Association has decided to leave prices unchanged for the first quarter of 1935, owing to unsatisfactory market conditions. International Wire Rod Cartel has raised the production quota for the first quarter by 30,000 tons to 350,000 tons.

British Prices, f.o.b. United Kingdom Ports

No. 24 gage...£11 5s.

*To March 1: 18s. 5d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £
Current dollar equivalent is ascertained by
multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at
present rate of dollar-franc exchange

present rate of dollar-fra
Billets, Thomas... £2 7s.
Wire rods, No. 5
B.W.G..... £4 10s.
Steel bars, merchant £1 5s.
Sheet bars..... £2 8s.
Plate, ½ in. and
up £4
Plate. 3/16 in.
and 5 mm... £4 2s. 6d
Sheets, ½ in.... £4 7s. 6d
Beams, Thomas... £3 2s. 6d
Angles (Basic)... £3 2s. 6d
Hoops and strip
base £4 2s. 6d
Wire, plain, No. 8 £5 7s. 6d
Wire nails £5 15s.
Wire, barbed, 4-pt.
No. 10 B.W.G... £8 15s.

... OBITUARY ...

THOMAS PROSSER, senior member of Thomas H. Prosser & Son, New York, importers and specialists in steel and Widia cemented carbide, died at his home at Garden City, N. Y., Dec. 23, aged 80 years. He is survived by four sisters and three brothers, one of whom, Richard Prosser, is now head of the firm. The firm was established in New York in 1845 by Mr. Prosser's grandfather, who owned a similar business in Birmingham, England. Since 1851, the firm has represented the Krupp company in this country. Mr. Prosser was a graduate of the Brooklyn Polytechnic Institute and member of the Railroad and Engineers clubs, and the Chamber of Commerce of New York.

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MILO S. KETCHUM, dean emeritus of the College of Engineering at the University of Illinois, died Dec. 19. He had been in failing health during the last five years. Dean Ketchum was born in 1872 at Burns, Ill. He received his bachelor degree in engineering at Illinois in 1895. During his career he had been contracting manager for the American Bridge Co., dean of the University of Colorado College of Engineering and administrative director of the Government powder plant at Nitro, W. Va. He retired last year as dean of the College of Engineering and director of the engineering experiment station of the University of Illinois.

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WILLIAM G. MATTHIAS, at one time with the Illinois Steel Co. at South Works and until five years ago with the Tennessee Coal, Iron & Railroad Co., died Dec. 19 at St. Petersburg, Fla., at the age of 63 years.

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GEORGE ALLEN WILLARD, inventor and former head of the Willard Machine & Tool Co., Covington, Ky., died at his home in Cincinnati, Dec. 21, aged 77 years. He retired in 1918 from active business, but had retained his interest and was widely known in financial circles. Born in Cincinnati, he was for years sole owner of the Willard Company.

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WALTER MACLEOD, British vice-consul for southern Ohio, president of the Macleod Co., manufacturer of sandblast equipment and foundry supplies, died at his home in Cincinnati, on Dec. 18. When 14 he went to Manchester, England, to live with an uncle, and there was an apprentice for seven years in an engineering works. He was a pioneer sand-blast

equipment manufacturer in this country.

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SELDEN S. DEEMER, New Castle, Del., for many years identified with the steel industry, died at his residence in New Castle, Del., Dec. 20, aged 73 years. He became connected with the steel industry at Chester, Pa., in 1876, operating a steel products plant in that city for 14 years. At that time he removed to Reading, where he became associated with the Walters Steel Co. He resigned this connection to establish the Deemer Steel Casting Co., at New Castle, of which he was president until his retirement from active business a few years ago. He continued as a director of the company until his death.

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VERNON ROYLE, president and treasurer, John Royle & Son, machinery manufacturers, Paterson, N. J., died at his home in that city, Dec. 17, aged 88 years. At an early age he entered the employ of the firm founded by his father in 1855. On the retirement of the latter in 1885, Mr. Royle became president, continuing in that capacity until his death. He was an inventor of devices for many different types of mechanical equipment, having been granted more than 100 patents.

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WILLIAM H. Roy, whose entire business career since 1900 has been with the Carnegie Steel Co., Pittsburgh,

died suddenly on Dec. 24, aged 54 years. In recent years Mr. Roy had been chief buyer in the company's purchasing department.

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WILLIAM CAMERON, president of the Cameron Can Machine Co., Chicago, died of pneumonia, Dec. 21. Mr. Cameron was born in Scotland where he served apprenticeship as a machinist. He went to Chicago in 1897.

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GEORGE HERBERT SANKEY, managing director of Joseph Sankey & Son, Bilston, and director of John Lysaght, Ltd., prominent sheet metal industrialist, died Dec. 19.

Holiday Quiet Prevails In Canada

TORONTO, Ont., Dec. 24.—Business is practically at a standstill in Canadian iron and steel markets as a result of the holiday season. A number of concerns also have curtailed plant operations until after the turn of the year. It is expected, however, that there will be a revival of business in the not distant future. W. W. Butler, president of Canadian Car & Foundry Co., addressing shareholders at the annual meeting in Montreal, stated that as railroads had made no big purchases in the past four years, they will be forced to enter the market for new rolling stock, etc., if they are to stay in business. He was unable to say, however, when orders would be placed, but believed they will come in the near future.



THE Navy's fastest transport ship, representing the newest developments in streamlizing, from an official Navy photograph during a test flight from the Naval Air Station at Anacostia.



Steel Basing Point Bombshell Is Handled Gingerly

ASHINGTON, Dec. 24. — Staffs of the National Recovery Administration and the Federal Trade Commission met at the offices of the latter last Fri-day, "conferred" over the divergent reports the two Government bodies have made on the steel basing points and adjourned. Having been an antigoldfish bowl session, nothing was given out on it. Like the reports themselves, caution was exercised to keep anything from leaking out.

Certain it is that the subject will not be discussed even remotely by either the FTC or the NRA. are treating it as gingerly as though it was a bombshell with only a second to go before the explosion. They apparently fear a serious repercussion that will open more widely the breach between them on the much-reportedon and much-discussed subject.

And it is because the conference is reported to have accomplished nothing that no statement was forthcoming. Reputedly it was a case of marching up the hill and down again. From one source it was claimed that the session succeeded only in emphasizing the differences in views. FTC was said to be holding doggedly for an f. o. b. mill basing system. NRA was supposed to be holding out with equal determination for the multiple basing point system with further expansion such as has already developed, partly due probably to its own endeavors but primarily by reason of the law of supply and demand, a law that appears to operate more or less despite brain trust attempts to out-mode, suspend or entirely eliminate natural

By L. W. MOFFETT Resident Washington Editor, THE IRON AGE

It was to be supposed that another effort of the two Government bodies will be made to coordinate the reports so that the twain may meet and go the White House with a single, united dissertation. However, no further meeting has been announced. Unless there has come a profound change of opinion on the explosive subject this will be impossible. The NRA has undergone reorganization since its former stand on the basing point system, and has brought in outsiders to assist in preparing the present report. Conceivably this may have developed an altered view but it is strongly doubted that, even though a revision of views has come over the organization, it is at all in accord with FTC

Donald Richberg, so-called No. 1 man of the Administration, still is head of the NRA legal division and "super-coordinator" of the alphabetical soup agencies, and whatever his difficulties may be in unscrambling the maze of Government bureaus, he is rated as still being a strong force in NRA. In the past he has made a stout defense of the multiple basing point system and subjected the FTC to withering scorn for its opposing attitude, and it hardly can be seen how this rift can be healed despite the desire to supply the President with a single basing point report. Moreover, rifts among Government bodies are the common thing these days and they are growing in number.

President Must Choose

Unless the President does get a single report it will be his responsibility to choose between the two reports, or accept portions of each, with regard to recommendations made. For inasmuch as he asked for recommendations it is to be assumed they have been prepared. He made a request for the basing point study by the two bodies jointly in his executive order which accompanied his approval on May 30 of the revised steel code. They were completed by Dec. 1, the time limit the President set, but they were far from being joined.

The FTC report was sent to the White House while the President was at Warm Springs, Ga. The NRA report was withheld. Meanwhile Mr. Richberg at the request of the NRA was asked to ascertain whether the President wanted the two reports coordinated, if possible. Apparently the President asked that an effort be made to coordinate the reports, for the conference between the NRA and FTC was called for that purpose.

The supposition is that the President desired recommendations for the purpose of presenting them to Congress. This can be only a supposition but it is a natural one in view of reports that legislation might be asked regarding the basing point system, unless the multiple system is left alone. Otherwise, it has been reported Congress might be asked to enact legislation requiring an f. o. b. mill basing system, assuming Congress has such power. However, other reports have it that the recommendations

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would be only for the purpose of the Administration for use if desired in further revising the steel code. Legislation for making f. o. b. mill quotations compulsory in industry has been considered over the past decade by sources hostile to the existing system, but it never got anywhere and evidently found small support. In these days, however, legislation which a few years ago would have been considered radical goes through Congress almost without dissension or a dissenting vote.

A Radical Congress

The new Congress, to begin its hectic session on Thursday of next week, will be the most radical Congress in American history. Despite views of so-called political analysts that the President again will retain control over it, there is some question as to whether he can keep it in line all the time. He didn't succeed in that direction even in the former Congress, great as was his power over Congress, and of course his power over the incoming Congress will be strong and dominating. Yet forces have been released that will be difficult to control when the new Congress takes its seat and turns loose such an orgy of proposed legislation, radical and weird, as has never been seen before. Obviously much of it will be for political effect, a capitalization of discontent, the playing of one class against another and the taking of advantage generally of the jittery emotions of the country. Yet it is a question as to whether some of the moves can be headed off. This will be a big problem for the President.

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While industry and the Administration do not see eye to eye on many matters it is clear a stronger spirit toward cooperation has been developed and may be expected to be reflected by the President in his message at the opening of Congress, even if parts of the New Deal program do not meet with approval from industry. At least there seems strong accord between the Administration and industry in combating wild legislation which undoubtedly will be dumped into the legislative hopper.

A Revolutionary Move

What constitutes radical legislation may be a matter of viewpoint. Certainly the iron and steel industry would look upon attempts to change over its basing system as a revolutionary move and out of line with the spirit of cooperation and truces. And it is the President's view on the subject, rather than the views of NRA or FTC, which is being taken seriously. It is only the part each report may have in determining the Presidential mind that is receiving important consideration.

The industry of course meanwhile awaits outcome of the White House effort to develop a truce between it and organized labor. Following the

White House conference on the subject last week, the President expressed the hope that the industry and union labor would reach an agreement. He requested that further conferences be held between both sides and the National Steel Labor Relations Board. Organized labor has held out for the idea "majority rule" with denial of any right to minority groups or individuals in dealing with employers. The industry's proposal provided for recognition of shop committees of the Amalgamated Association of Iron, Steel and Tin Workers, the right of minorities and individuals, and for settlement of disputes by arbitration through the steel board. The terms of the truce as proposed by the steel board were not made public at the White House conference.

A. F. of L. and Section 7-a

Even in time of war, however, the American Federation will insist upon enforcement of Section 7-a. This resoundingly militant attitude has been announced by President William Green. It was brought forth by the "revelation" that the War Department in its plans for industrial mobilization proposes abrogation of the collective bargaining section of the recovery act during war. This "startling" disclosure was made by Lieut. Col. C. T. Harris before the Senate Munitions Committee last Friday. When the Colonel's testimony was made known to Mr. Green, the latter immediately declared war on the War Department and fired the opening gun. Mr. Green declared that "labor certainly would resist with all the power it possesses the scrapping of 7-a, war or no war."

Colonel Harris actually neither confirmed nor denied that the section would be abrogated under the War Department plans but in reply to a question as to whether this would be the result, he significantly stated:

"Well, you can't have two bosses in time of war."

He denied draft of labor in time of war is contemplated. Certain it is that industry will be drafted and told just what it will do in time of war with just as little in way of profit as possible. And in taking such a stand the Government undoubtedly will find extremely strong public support to compel action on that part of industry which might seek to fall in line with the industrial mobilization plans.

Bernard Baruch, whom President Roosevelt has appointed to head a committee to study further the question of "taking the profit out of war," repeated to the House Committee on Foreign Affairs views he has often stated as to the necessity of the United States accumulating in times of peace supplies of minerals and metals on which it is dependent from foreign sources. Speaking specifically of tin he recommended that the Government buy large quantities to be

stored for use in times of emergency. Mr. Baruch, who was chairman of the War Industries Board, in reply to a question as to making an agreement with Great Britain, which controls the world's tin supply, said such a plan "might be a good solution, but I'd rather have it here and I'd be prepared against everybody, even my best friend."

In response to the suggestion that the United States accept tin in payment of war debts, which was recalled by Chairman McReynolds, Mr. Baruch said he thought to do so "would be helping things along." Actually there is apparently scant belief that the arrangement can be made.

The hearing, however, promises to give further strength to the bill introduced in the last session of Congress to bar exports of tin plate scrap. This measure is expected to be called up early in the new session, and is supported by the War Department.

Contractors to Propose Public Works Plans

WASHINGTON, Dec. 24.—Confident that a sustained rise in the volume of construction will restore normal prosperity to the United States, and that this can be attained in 1935 through an intensified application of the methods and experience of the past year, the Associated General Contractors of America will hold their sixteenth annual convention, Jan. 28, 29 and 30, at Washington, prepared to discuss and emphasize what it considers a need for a sound and well-rounded program of public works.

Pointing out that, due to the functioning of PWA, the present year has witnessed the first rise in the annual volume of construction since 1928, Edwin J. Harding, managing director of the contractors' national association, states that if the rise can be sustained and continued throughout the coming year to a point at least equal to the construction volume of 1930, a consistent rise in general business indices and the steady absorption of the unemployed will usher in a period of actual national recovery within the next 12 months.

Taking the report and recommendations of President Roosevelt's National Resources Board in regard to public works as an officially recognized basis for its contentions, the convention will urge the development of a program calculated to encourage the revival of private construction and, at the same time, to fortify it by an underwritten volume of public works sufficient to guarantee the attainment of at least a stipulated minimum of construction activity during the coming year.

Steel and Other Companies Plan Large Industrial Expenditures During 1935

WASHINGTON, Dec. 24. — Rew sponding to inquiries made by Federal Housing Administrator James A. Moffett, a group of large industrial concerns have reported that they are planning or have in operation plans for plant betterments and replacements that will mean cash expenditures approaching \$500,000,000 in 1935. These planned expenditures are either new or large increases over similar expenditures made during 1934, and, in some instances, for the past several years. The figures do not include the usual expenditures for necessary repairs to plants and equipment; they are solely for betterment and replacement.

Recently Administrator Moffett announced, in an address before the New York Advertising Club, that three concerns had told him of plans for spending \$313,000,000 on such work during the coming year. He named them as the American Telephone & Telegraph Co., \$200,000,000; United States Steel Corpn., \$40,000,000, and Standard Oil Co. of New Jersey, \$73,000,000.

Since that time other firms have sent word to Mr. Moffett that their betterment and replacement programs will mean an immediate start on work that will involve expenditures of nearly \$100,000,000 additional.

Bethlehem Plans Improvements

Bethlehem Steel Corpn. plans to spend \$25,000,000; three corporations of the oil industry, an indicated total of \$137,000,000, of which total approximately \$70,000,000 was included in the figures given out last week, and the American Radiator & Standard Sanitary Corpn., \$5,000,000.

Industry, it was announced, is showing more and more tendency to cooperate with and take advantage of the stimulation of the durable goods industry, and preliminary replies from other great concerns were said to indicate that industry generally is laying plans now for emulating firms that have already set their programs.

More Encouragement for Plant

With a view to giving further encouragement to modernization of machinery and plant along lines being reported to the FHA, the Reconstruction Finance Corpn. recently modified its policy so that applications for loans will be considered when a substantial portion of the proceeds of loans is to be used for substitution of improved machinery, etc. These loans, however, will be based upon four provisions, as follows: First, the loan

must be adequately secured; second, economic need for the installation of the new machinery must be shown and such installations must be proved to increase substantially the productive capacity of the plant; third, satisfactory evidence must be submitted that the loan could be amortized from net earnings during a five-year period and, fourth, the applicant must show that it has sufficient current operating assets to meet its normal requirements.

Alloys Code Authority Membership Increased

WASHINGTON, Dec. 24.—The number of voting members of the code authority for the alloys industry has been increased from seven to eight, and the election of alternates provided, by an amendment approved conditionally by the National Industrial Recovery Board. The amendment becomes effective Dec. 28 unless good cause to the contrary is shown before that date.

Suggestions or objections must be submitted before then to Deputy Administrator W. A. Janssen, 3323 Department of Commerce. Provision for additional association members of the code authority was considered advisable, to insure representation for all phases of the industry.

The code authority for the alloys industry has also petitioned the NIRB for approval of its budget and of a basis of contribution by members of the industry. The budget totals \$11,940, for the period Sept. 15, 1934, to Sept. 14, 1935.

WIRE, ROD AND TUBE DIE

Under a proposed amendment to the wire, rod, and tube die industry, employees would be permitted to work during peak seasons not more than 44 hr. a week, not to exceed four weeks in each six-month's period, provided overtime wages at one and a half times the normal rate are paid. The code has a basic 40-hr. moximum work week. Objections or subbestions to the proposed amendment must be filed with Acting Deputy Administrator Dexter A. Tutein before Jan. 7.

AIR VALVE INDUSTRY

The air valve industry code authority has made application to the NIRB for approval of an amendment to its code which will enable it to formulate a budget and a basis of contribution by members of the industry. The total amount of the budget for the period from July 1, 1934, to June 30, 1935, is \$6,500. The same code authority has also asked for the termination of the exemption conferred in Administrative Order X-36, of May 26, 1934, whereby members of this industry whose

principal line of business is embraced in a trade or industry subject to a code other than the code for the air valve industry were exempted from the obligation to contribute to the expense of code administration for that industry.

CANNING AND PACKING MACHINERY AND EQUIPMENT

The code authority for the canning and packing machinery and equipment industry has made application for approval of its budget for code administration, and the proposed basis of contribution to the same by members of the industry.

The total amount of the budget for 1935 is \$12,000. The basis of contribution proposed is as follows: Two mills on the dollar volume of sales for the year 1933.

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CODE AUTHORITY MEMBERS APPROVED

The NRA has announced recognition of the following as duly elected members of code authorities:

Chemical Engineering Equipment Industry (Division of the machinery and allied products industry)—Samuel Alsop, Alsop Engineering Co., New York; C. L. Campbell, E. B. Badger & Sons Co., New York; J. V. N. Dorr, Dorr Co., New York; Howard Farkas, United States Stoneware Co., New York; P. C. Kingsbury, General Ceramics Co., New York; H. D. Miles, Buffalo Foundry & Machine Co., Buffalo; James E. Moul, Turbo-Mixer Corpn., New York; L. P. Sharples, Sharples Specialty Co., Philadelphia; W. E. Hall, Duriron Co., New York; L. H. Harvison, M. W. Kellogg Co., New York; S. F. Spangler, Chemical Construction Corpn., New York; Arthur Wright, Arthur Wright, and Associates, New York; M. J. Sayles, Independent Filter Press Co., Brooklyn, and Franklin Wedge, Electro-Chemical Supply & Engineering Co., Paoli, Pa.

Rolling Mill Machinery & Equipment Industry (Division of the machinery and allied products industry)—L. W. Mesta, Mesta Machine Co., Pittsburgh; P. M. Morgan, Morgan Construction Co., Worcester, Mass.; Frank Cordes, Lewis Foundry & Machine Co., Pittsburgh; G. R. Casey, Treadwell Engineering Co., Easton, Pa.; H. V. Blaxter, Mackintosh-Hemphill Co., Pittsburgh, and Harvey O. Yoder, Yoder Co., Cleveland.

Electro-plating and metal polishing and metal finishing industry (District Code Committee for District No. 2)—F. W. Carr, Panther Plating Co., Ft. Worth, Tex.; J. P. Koley, Koley Plating Co., Omaha; and J. C. Cartwright, Fargo Plating Co., Fargo, N. D.

Electro-plating and metal polishing and metal finishing industry (District Code Committee for District No. 9)—Charles Schwarts, Quality Plating Works, Evansville, Ind.; Ralph Stolle, Stolle Corp., Cincinnati; N. H. McKay, U. S. Chromium Co., Pittsburgh; William Hohman, Hohman Plating Co., Dayton, O.; and Fred Mootz, Right Plating Co., Indianapolis.

Industry engaged in the smelting and refining of secondary metals into brass and bronze alloys in ingot form—John Hopp, consulting metallurgical engineer of Chicago, as administration member of the code authority, to succeed Kern Gill, resigned.

TELEPHONE AND TELEGRAPH

The National Industrial Recovery Board is said to be considering a code for the communications industry. The proposed plans are something of a plan, for it has recently been indicated at Washington that only those industries desiring to be codified would get them in the future. The board has made no official announcement on the subject.

Bardo Replies to "Premature" Critics

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ASHINGTON, Dec. 24.—New Deal and other critics of the recovery program proposed by the Chamber of Commerce of the United States and the National Association of Manufacturers at their joint conference in White Sulphur Springs, W. Va., have been informed by President C. L. Bardo of the latter organization that their criticism has been based largely upon things which the platform does not contain. He pointed out especially that the dole was not recommended but that rewarded work was. He also pointed out that return of relief functions to local government "as soon as practicable" was urged.

The program as a matter of fact in these two particular respects as well as in other directions is entirely with plans of the Roosevelt Administration itself. Moreover, in spite of the attitude of some critical members of the Administration, the White House has indicated it will give careful consideration to the program, which clearly was framed in conciliatory terms and in a spirit of cooperation. While President Roosevelt did not see President C. B. Ames of the conference when the latter presented the program at the White House there was no presidential "rebuff" to Mr. Ames or the organizations he represented. Mr. Ames explained he sought no appointment with the President, who was engaged in conference when the visit was made, and that he could not remain over in Washington till the following day to see Mr. Roosevelt.

The President has been represented as giving study to the program and as being glad to receive any "cooperative suggestions" from business, labor or any other quarter. The program adopted was similar to recommendations made previously by the Chamber and the National Association of Manufacturers through meetings held independently.

Forged Tool Simplified Practice Plan Revised

WASHINGTON, Dec. 24. — The standing committee in charge of Simplified Practice Recommendation R17-31, concerning forged tools, has submitted the third revision of this recommendation, and the division of simplified practice of the National Bureau of Standards has mailed copies to all interests for acceptance. The original of this recommendation was effective on July 1,

1924. The first and second revisions were effective from April 1, 1927, and July 1, 1931, respectively.

The recommendation covers kinds, sizes, weights, etc., of forged tools of various descriptions such as picks, mattocks, hoes, bars, wedges, sledges, hammers and mauls, railroad track tools, blacksmith anvil tools, tongs and miscellaneous tools. The dimensions of eyes for these tools are included. The current revision includes a number of tools not in the last revision.

Steel Casting Orders Higher in October

WASHINGTON, Dec. 24.—New orders for steel castings amounted to 24,327 net tons during October, according to reports to the Bureau of the Census from 164 manufacturers with a monthly capacity of 156,646 tons. September bookings totaled 20,030 tons, while orders in October, 1933, were 26,135 tons.

October castings production was 29,142 tons, compared with 31,816 tons in the preceding month and with 27,826 tons in October, 1933.

Clayton-Mark Hearings Indefinitely Postponed

WASHINGTON, Dec. 24.—Upon the joint request of the company and members of the New Deal Lodge No. 59, Illinois, Amalgamated Association of Iron, Steel and Tin Workers, the hearing in the Clayton-Mark Mfg. Co. case, scheduled for last Wednesday were indefinitely postponed by the National Steel Labor Relations Board.

River Movement of Steel Gains

MOVEMENT of iron and steel products on the Ohio River in the Pittsburgh district in November amounted to 51,710 net tons, compared with 46,475 tons in October, 45,848 tons in September, and 39,573 tons in November, 1933, according to the latest report of the United States Engineer Office, Pittsburgh. Total

movement of steel products on the Monongahela River in November was 48,556 tons, compared with 43,347 tons in October, and 28,216 tons in November, 1933. Shipments of iron and steel on the Allegheny River last month totaled 4300 tons.

Gammons-Holman Pays Christmas Bonus

THE Gammons-Holman Co., Manchester, Conn., manufacturer of spiral reamers and special fine cutting tools, declared to all employees a Christmas bonus of 1 per cent of the total year's earnings of each individual in the organization. The company has had a definite improvement in business in 1934 and its records show that there has been an average increase of \$275 in the yearly wages per man over 1933. This wage increase is due entirely to better business and additional working hours, rather than to code requirements, for the company has maintained its wage standards over a long period of years.

TRADE NOTES

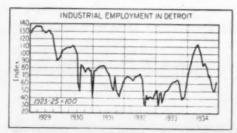
Philip G. Mumford, president of American Machine and Metals, Inc., parent organization of many nationally known concerns, has announced that his company has acquired the DeBothezat Corpn., makers of fans, blowers and other ventilating equipment. Simultaneously, it is announced that the DeBothezat factory has been removed to the new and modern plant located in Troy, N. Y. Executive and sales offices will be located at 100 Sixth Avenue, New York. Mr. A. Ralph Stephan has been appointed vice-president and general manager of the DeBothezat Corpn.

Worthington Pump & Machinery Corpn., New York, has established a Pacific Coast regional headquarters at Los Angeles, which will center jurisdiction and development of the corporation's business in the West, now included in the coverage of district offices in Seattle, San Francisco, Los Angeles and El Paso, Tex. C. E. Wilson, vice-president, is in charge of the Pacific Coast division, with headquarters at 510 West Sixth Street, Los Angeles.

Champion Rivet Co., Cleveland, his appointed Root Neal & Co., Buffalo, as welding electro distributer for western New York, and Tanner & Co., Indianapolis, as distributer for Indiana.

Austin-Hastings Co., Parkett Machinery Division, 226 Binney St., Cambridge, Mass., has been appointed distributers in the New England territory for Henry Pels & Co., Inc., New York.

Dumore Co., Racine, Wis., has acquired more spacious and modern factory building at Fourteenth, Racine and Clark streets. In addition to providing for future expansion. new building and equipment being purchased will offer opportunities for systematic and efficient production of the Dumore line of fractional horsepower motors, grinders and electric appliances.





THIS WEEK ON THE

Steel Buying Spurts as Car Makers Plan Large January Output

DETROIT, Dec. 24.

NE of those periodic cyclonic production storms, which visit the automobile industry now and then, struck Detroit the past week. It had the steel people, especially the makers of sheets and strip steel, running around in circles as they sought to give motor car companies immediate delivery of large tonnages. It put many machining departments in automotive plants and many parts manufacturers on three 8-hr. shifts to meet assembly line requirements. It resulted in a mad rush on the part of everybody concerned with motor car production to get cars into dealers' hands as quickly as possible.

Orders have piled up at factories in such huge quantities that tentative schedules for January sound almost unbelievable. General Motors, Ford and Chrysler, which together have built and sold about 91 per cent of all cars in 1934, have set a goal of 277,000 units for January. Hudson has 11,000 as its objective, so that the entire industry hopes to reach the 300,000 mark or perhaps exceed it.

Ford has the largest individual schedule, aiming at 110,000 units next month. In fact, it would like to turn out 150,000 units, if that were possible. Chrysler Corpn. has in mind the assembly of 61,000 units the coming month, of which around 35,000 will be Plymouths. Chevrolet is planning on 70,000 units, mostly Standard passenger cars and trucks. Pontiac and Oldsmobile are each pointing their production arrows at a 15,000 bull's-eye.

Flow of Materials Is Limiting Factor There is one important point, however, on which there is disagreement. How fast can output be accelerated? To considerably more than double assemblies from one month to the next is no mean achievement, unless by chance production had sunk to insignificant proportions. When one is talking in terms of stretching output up around 300,000 units, then everything must click perfectly if a speci-fied goal is to be attained. The manpower exists in southern Michigan for automobile companies to increase operations at a break-neck clip. The flow of raw materials and parts will be the limiting factor. How close to their objective car manufacturers will get is dependent on how quickly steel and automobile parts can be made and delivered. Many steel mills are using emergency means to keep automotive plants supplied with sheets and strip steel. Trucks are hauling steel from far-distant mills which usually ship by railroad. Even airplanes are being requisitioned to deliver much-needed tonnages.

No matter what the January total, it is certain to be the best in five years and has a slim chance of nosing ahead of the 283,610 units made in January, 1930. Last January the industry assembled 163,811 units; in 1933, 132,183; in 1932, 123,075; and in 1931, 178,344. December output will be greater than early estimates had indicated, with a probability that the final figure will be around 145,000 units, as against 83,755 units in the same month a year ago. In fact, one has to go back to 1930 to discover a higher December production.

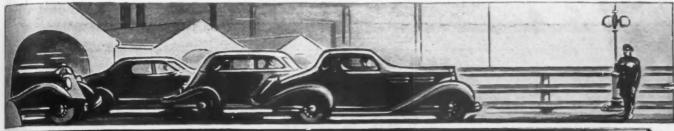
This month's relatively good showing has been made possible by the fine performance of Chrysler Corpn., which will turn out 50,000 to 55,000

units. Plymouth alone will come close to 35,000 units. It is up to 1600 cars a day and will attain capacity operations in January. One day the past week all of the Chrysler divisions turned out a total of 3024 cars. Chrysler has on hand orders for over 120,000 cars, half of which are for Plymouths.

Steel bookings have been so heavy that the tonnage in the aggregate this month will be the best since last June, when users stocked up in anticipation of price advances. One company declares that its automotive orders in December will be the largest since March, and at least one other company states that December sales by its Detroit office will set a new high mark for the year.

It would be unkind perhaps to remind automotive executives that they might easily have fulfilled their fondest hopes for January if they had ordered steel and other commodities several weeks ago instead of waiting until the last possible minute. The only explanation for the present rush is that the motor car industry has operated in this irregular and highly unsatisfactory manner for years and resistance to change, if nothing else, seems to prohibit more orderly procedure. What matters it if all its suppliers get high blood pressure?

Those who are looking for sensational changes in body treatment the coming year will be disappointed. So-called stream-lining will be in evidence, but nothing so radical as the Airflow car of a year ago is in sight. From the standpoint of appearance, probably the most striking innovation is the turret top with its shining, unbroken expanse of steel. One of the troublesome problems created by the



ASSEMBLY LINE

turret top, it is said, was to find a satisfactory place to put the radio aerial. Every point possible, except in the carburetor, was tried, and finally it is understood that the underside of the running board was hit upon with good results.

New Method of Body-Frame Assembly

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Chrysler-made cars, aside from the Airflows which already are constructed according to new principles of body design, have a new method of body-and-chassis assembly. Frame side members are no longer straight, but are bowed out to follow the contour of the body. Body sills are eliminated so that the body rests directly on the frame to which it is bolted through the top as well as the sides of the frame at 46 points. It is claimed that this method gives an unusual degree of rigidity and results in elimination of body squeaks and rattles. This design for the more conventional models comes as close as is possible to the unit construction of the Airflow.

Prices announced by De Soto confirm the belief that the Airflow is to be relegated to a secondary position. All Airflow models are \$1,195 at the factory, compared with \$995 the past year, or about \$400 more than was charged for the De Sotos of 1933. The Airstream De Soto, with more conservative lines, is priced at \$695. A parallel situation exists in the Chrysler division. Chrysler has an Airstream six (118-in. wheelbase) and Airstream eight (121-in. wheelbase). There will be an Airflow eight on a 123-in. wheelbase, an Imperial Airflow on a 128-in. wheelbase, and Custom Imperial Airflow on 127-in. and 146-in. wheelbase.

Plymouth Offers "Floating Ride"

Plymouth is announcing four de luxe models and two models formerly known as the "Plymouth six." All six are on a 113-in. wheelbase. The car is three inches longer and three inches wider. Plymouth likes to refer to the weight redistribution in its car as giving passengers a "floating ride." Incidentally, there is scarcely a 1935 car which has not had the

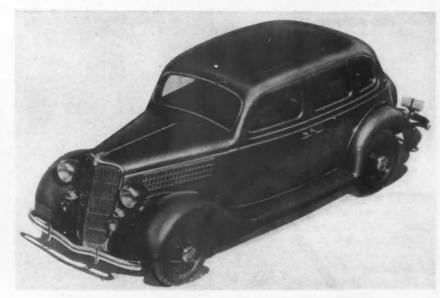
By BURNHAM FINNEY
Detroit Editor, THE IRON AGE

engine moved forward and the rear seat brought ahead of the rear axle, a principle first introduced a year ago by the Chrysler and De Soto Airflows. It might be said, in passing, that most makers also have adopted the lines of the Airflow from the front windshield back to the rear of the car. The main difference between the Airflow and 1935 cars of less radical design is in front-end treatment.

Among Plymouth's improvements the coming year are a new ventilated clutch, ventilated generator, fulllength water jackets surrounding the cylinder bores, calibrated ignition to eliminate "knock" on quick acceleration, new tapered leaf springs made of molybdenum steel, and the features carried over from previous models, such as hydraulic brakes, floating power, valve seat inserts and all-steel body. Plymouth's prices are the same on some models for 1935 as for 1934 and up \$5 on others. However, it is evident that these prices will be readjusted if necessary after Ford announces.

Pontiac's most distinctive feature, which will enable everyone to identify its sixes and eights on the street, are 11 parallel chrome-plated steel beadings extending from the cowl along the middle of the hood and down the radiator grille. Practically the only difference between the de luxe and Stan-

(Continued on Page 55)



PICTURED above is the new Ford de luxe Fordor Sedan for 1935 which has just been announced. The new Ford V-8 cars have new, modern body lines and a combination of engineering improvements giving greater ease of control and increased riding comfort. These include relocation of the front spring and engine farther forward, and seating of the passengers between the wheels and closer to the center of the car to provide improved car weight balance and passenger weight distribution. Crankcase ventilation has been added to the Ford V-8 engine, of which more than 1,300,000 are now on the road.

BULLARD TYPE "J"

The Small
Mult-Au-Matic
for
Speed and Flexibility

LOWER
COSTS
thru
Achievement
in
Efficiency
and
Economy

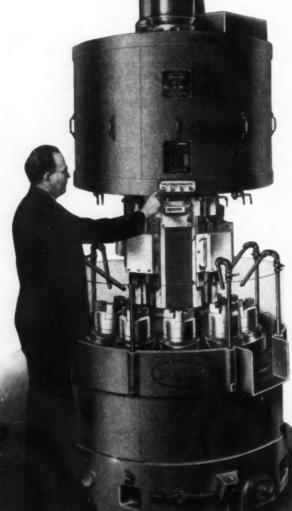
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41 Changes
at each of
7
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Dual Speed Range



Variable and
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Double Index Feature



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Rising Demand Holds Holiday Interruption to a Minimum

Most Mills Shut Down for Christmas Only—Ingot Output Reaches

36½ Per Cent—Automobile Industry Presses for Deliveries

ACCUMULATING pressure for steel, particularly on the part of the automobile industry, has held the holiday interruption in steel works activity to a minimum. Plans to suspend mill operations for three days—from Saturday night through Tuesday—were generally revised and in most cases Christmas shutdowns have been limited to three or four turns. Ingot output has risen another point to 36½ per cent, and will probably make further gains before the year end.

AUTOMOBILE makers have gotten into production in earnest. December output, now estimated at 145,000 cars, will exceed earlier estimates, and January production will be the largest for that month in five years, with the final total dependent on how quickly steel and automobile parts can be made and delivered.

Steel bookings from the motor car trade this month will be the largest since last June, when material was being stocked in anticipation of price advances. Recent purchases included heavy tonnages from Ford covering January needs, releases for 25,000 jobs from Oldsmobile and orders from Hupp for 2000 cars. The machining departments in automotive plants and many parts manufacturers have gone on three 8-hr. shifts to meet assembly line requirements, and steel mills, especially makers of sheets and strip, are being pushed hard for deliveries. Industrial employment in Detroit has reached the highest level for this season since 1929.

DETROIT steel ingot output has risen from 62 to 66 per cent in its third consecutive weekly increase. Operations also have risen two points to 56 per cent in the Cleveland-Lorain area, six points to 41 per cent at Buffalo, one point to 26 per cent in the Philadelphia district and one-half point to 37 per cent at Chicago. Elsewhere production rates are substantially unchanged.

Iron and steel demand from farm equipment and tractor makers and from a wide range of miscellaneous sources—including shovel manufacturers, road machinery builders, stove plants and electric refrigerator makers—continues to point upward. One electric refrigerator plant has raised output from 1100 to 1500 units a day.

Bolt and nut business has been stimulated by the recent announcement of price advances effective Jan. 1. With this exception, there is little inclination to build

up stocks, contracting being at a minimum. Buyers are still keeping a close watch on Washington for changes in NRA policy on code price control and for developments that may grow out of the NRA and Federal Trade Commission reports on the steel basing point system.

ABRICATED structural steel awards of 11,200 tons compare with 10,650 tons a week ago. Sheet piling contracts include 2800 tons for a dam on the Mississippi River at Muscatine, Iowa.

Business in tubular products has succumbed temporarily to holiday influences, but bookings for the month will at least match those of November. The major oil companies' plans for 1935 augur well for drill pipe, casing and tubing. Increased drilling is contemplated in both California and the Gulf States, 10,000 new wells in the east Texas field being mentioned in some forecasts.

Prospects for railroad buying remain obscure. Heavy purchases are considered out of the question until the present freight rate case comes to a decision and the pressing financial problems of many of the carriers are brought nearer a solution. Pending railroad orders include two coal barges for the Pennsylvania, calling for a total of 500 tons, and a ferry boat for the Erie, also requiring 500 tons. The Ensley rail mill has shut down after a short run and the Chicago rail mills are idle.

PIG IRON shipments have shown a further increase in the Great Lakes area. At Detroit they are running 25 to 30 per cent ahead of November. Although many foundries, particularly jobbing plants, are down for the year-end inventory period, automotive plants in most cases will be idle Christmas day only. An Ohio sanitary ware manufacturer is now operating 24 hr. a day.

Competition from foreign steel is again being felt along the Eastern seaboard. Not only are low base prices being quoted but extras are commonly being waived. An order for 800 tons of sheet piling, the largest private purchase in months, has been placed with a German mill.

Scrap prices, though still buoyant, have made no further advances, THE IRON AGE composite remaining at \$11.58 a ton. The pig iron and finished steel composites are unchanged at \$17.90 a ton and 2.124c. a lb. respectively.

A A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous Advances Over Past Week in Heavy Type, Declines in Italics

Dec. 2 1934	4, Dec. 18 1934	8, Nov. 2 1934	7, Dec. 26, 1933	Finished Steel	Dec. 24 1934	Dec. 18, 1934	Nov. 27 1934	Dec. 2
				Per Lb.:	Cents	Cents	Cents	Cents
\$20.26 18.50			\$19.26 17.50			2.40	2.40	2.25
						0.50	0.50	0.0-
								2.35
								2.85
								2.95
				Hot-rolled sheets, No. 10, P'gh				1.75
								1.85
				Wire nails, Pittsburgh				2.35
				Wire nails, Chicago dist. mill				2.40
				Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
	24.04	24.04	20.01	Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.25
85.00	85.00	85.00	82.00			3.00	3.00	2.85
						3.05	3.05	2.90
						\$5.25	\$5.25	\$5.25
cuvery	to round	aries in	the Chi-	Scran				
				Per Gross Ton:				
				Heavy melting steel, P'gh	\$13.25	\$13.25	\$11.25	\$12.50
				Heavy melting steel, Phila	10.75	10.75	10.25	11.00
	***	***	****	Heavy melting steel, Ch'go	10.75	10.75	9.50	9.75
				Carwheels, Chicago	11.50	11.50	10.00	10.00
				Carwheels, Philadelphia	10.75	10.75	10.75	11.75
	27.00	27.00	26.00	No. 1 cast, Pittsburgh	12.75	12.75	11.50	11.25
28.00	28.00	28.00	26.00			11.00	11.00	12.50
27.00	27.00	27.00	26.00			10.00	8.50	9.50
32.00	32.00	32.00	31.00			11.25	11.25	11.00
38.00	38.00	38.00	36.00	0.0				8.50
Cents	Cents	Cents	Cents	Tion I Islan Wilder, On Bo (mot)	2170			
1.70	1.70	1.70	1.60					
				Coke, Connellsville				
				Per Net Ton at Oven:				
				Furnace coke, prompt	\$3.85	\$3.85	\$3.85	\$3.75
Cents	Cents	Cents	Cents	Foundry coke, prompt	4.60	4.60	4.60	4.25
1.80	1.80	1.80	1.75					
1.85	1.85	1.85	1.80					
1.85	1.85	1.85	1.80	Matala				
2.13	2.13	2.13	2.08	IVICTAIS .				
1.80	1.80	1.80	1.70	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
1.85	1.85	1.85			8.75	8.75	8.75	8.00
2.08	2.08	2.08	1.98			9.121/2	9.12 1	8.25
1.80	1.80	1.80				50.95	51.30	52.87
1.85	1.85	1.85	1.75	Zinc, East St. Louis			3.67 1/	
				Zinc, New York			4.02 1/2	
2.05 14								
2.05 1/4						3.55	3.35	4.05
2.10	2.10	2.10 1.85	2.10 1.75	Lead, St. Louis Lead, New York	3.55	3.55 3.70	3.35 3.50	4.05
	1934 \$20.26 18.50 19.13 14.50 19.76 18.00 20.76 18.50 24.04 85.00 24.04 85.00 27.00 27.00 27.00 27.00 27.00 32.00 38.00 Cents 1.70 Cents 1.80 1.85 1.85 2.13 1.80 1.85	1934 1934 \$20.26 \$20.26 18.50 18.50 19.13 19.13 14.50 18.50 18.76 19.76 18.00 18.00 20.76 20.76 18.50 18.50 24.04 24.04 85.00 85.00 27.00 85.00 27.00 27.00 28.00 28.00 27.00 27.00 38.00 38.00 Cents Cents 1.70 1.70 Cents Cents 1.80 1.85 1.85 1.85 1.85 1.85 2.13 2.13 1.80 1.80 1.80	1934 1934 1934 \$20.26 \$20.26 \$20.26 18.50 18.50 18.50 19.13 19.13 19.13 14.50 18.50 18.50 18.76 19.76 19.76 18.00 18.00 18.00 20.76 20.76 20.76 18.50 18.50 18.50 18.50 18.50 18.50 24.04 24.04 24.04 85.00 85.00 85.00 Ty in South; in the North th	1934 1934 1934 1933 \$20.26 \$20.26 \$20.26 \$19.26 18.50 18.50 18.50 17.50 19.13 19.13 19.13 18.13 14.50 18.50 18.50 17.50 18.50 18.50 18.50 17.50 19.76 19.76 19.76 18.76 18.00 18.00 18.00 17.90 20.76 20.76 20.76 19.76 18.50 18.50 18.50 17.50 24.04 24.04 24.04 23.54 85.00 85.00 85.00 82.00 27.00 27.00 27.00 26.00 28.00 28.00 28.00 32.00 27.00 27.00 27.00 26.00 28.00 28.00 28.00 30.00 27.00 27.00 27.00 26.00 28.00 28.00 28.00 36.00 Cents Cents Cents Cents 1.70 1.70 1.60 Cents Cents Cents Cents 1.80 1.80 1.80 1.70 1.85 1.85 1.85 1.80 2.13 2.13 2.13 2.08 1.80 1.80 1.80 1.70 1.85 1.85 1.85 1.85 1.85 1.85 1.85 1.85 1.80 1.80 1.80 1.70 1.85 1.85 1.85 1.85 1.85 1.85 1.85 1.85 1.80 1.80 1.80 1.70 1.85 1.85 1.85 1.85 1.75 2.08 2.08 2.08 1.98 1.80 1.80 1.80 1.70	1934 1934 1934 1933 1934 1934 1934 1935 1946 1935 1935 1850	1934 1934 1933 Pinished Steel 1934 1933 Per Lb.: Cents	1934 1934 1934 1933 1933 1934 1835 18.50	1934 1934 1933 1934 1933 1934 1934 1934 1936 1936 1850 18.50

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Steel Scrap

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. ‡Blue Eagle copper.

The Iron Age Composite Prices

Pig Iron

Dec. 24, 1934 One week ago One month ago One year ago	2.124c, a Lb. \$17.90 a Gross Ton 2.124c. 17.90 2.124c. 17.90 2.008 16.90		\$11.58 a Gross Ton 11.58 10.33 11.08
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh. Philadelphia and Chicago.
1934 1932 1931 1930 1928	HIGH LOW 2.199c., April 24; 2.003c., Jan. 2 2.015c., Oct. 3; 1.867c., April 18 1.977c., Oct. 4; 1.926c., Feb. 2 2.037c., Jan. 13; 1.945c., Dec. 29 2.273c., Jan. 7; 2.018c., Dec. 9 2.317c., April 2; 2.273c., Oct. 29 2.286c., Dec. 11; 2.217c., July 17 2.402c., Jan. 4; 2.212c., Nov. 1	#IGH LOW \$17.90, May 1; \$16.90, Jan. 27 16.90, Dec. 5; 13.56, Jan. 3 14.81, Jan. 6; 13.56, Dec. 6 15.90, Jan. 6; 14.79, Dec. 15 18.21, Jan. 7; 15.90, Dec. 16 18.71, May 14; 18.21, Dec. 17 18.59, Nov. 27; 17.04, July 24 19.71, Jan. 4; 17.54, Nov. 1	#HOH Low \$13.00, Mar. 13; \$9.50, Sept. 25 12.25, Aug. 8; 6.75, Jan. 15 13.3, Jan. 6; 8.50, Dec. 29 17.58, Jan. 29; 14.08, Dec. 29 16.50, Dec. 31; 13.08, July 15.25, Jan. 11; 13.08, Nov. 22

Finished Steel

Holiday Suspensions Are Restricted at Pittsburgh



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Mill Shutdowns Limited to Three or Four Turns—Output Due to Show a Steady Rise in Remainder of Week

PITTSBURGH, Dec. 24.—Insistent demand for finished steel has altered previous plans of some mills to curtail activity sharply during the holidays. Shutdowns of three and four turns are more generally the rule than original intentions of recesses for two and three days. Resumption of operations on Dec. 26 will probably initiate a rising output for the remainder of the week. Some finishing mills will dispatch shipments during this week without holiday interruptions.

Discounting shutdowns on Christmas day, ingot production in the Pittsburgh district this week will probably average not less than last week's rate of 24 per cent of capacity. In the Wheeling district production is holding at 70 per cent. Output in the Valleys and nearby northern Ohio mills will likely be sustained at 41 per cent.

Demand is strong from automotive centers and also is encouraging from miscellaneous sources. Agricultural implement makers and electrical equipment manufacturers are actively interested in sheets.

Pig Iron

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Holday influences have depressed activity, but a few small-lot orders are being received for urgent needs. Foundries in the Pittsburgh district have not thus far benefited noticeably from the proposed installation of new type airbrakes. Automobile castings comprise a negligible share of foundry business in this district. Steel foundries are not active. Although January is not expected to usher in buying in major lots, the extremely low position of general inventories promises at least a fairly regular flow of morerate-sized orders.

Semi-Finished Steel

With many finishing mills closed over the holiday week-end, there is a pause in the movement of semi-finished grades. Releases have already been placed for shipments on Dec. 26, particularly for sheet bars for tin plate conversion and for rolling of auto body sheets. Forging shops are appearing more frequently in this market as automotive production gains ground.

Rails and Track Accessories

The year end has brought a marked lull in this market. Broadly, prospects for rail and accessory buying by the carriers in the coming year are rather drab. Disposition of the railroads' demands for freight rate increases and the solution of complex financial problems are considered temporary obstacles to be hurdled before heavy buying can be considered. In connection with the carriers' proposal to increase freight rates, there is a good deal of speculation as to the net result of such advances to the railroads' incomes. Undoubtedly a sizable share of current freight moving by rail would be diverted to truck transportation in the event of a general freight increase.

Bolts, Nuts and Rivets

Specifications have been placed with more freedom, particularly by jobbers, since the announcement of higher first quarter prices. In fact, the jobbing trade is the mainstay of current activity. In the spot market, competition still is severe, with some quotations being made at below fourth quarter schedules. Large producers have expressed intentions to adhere uniformly to the higher prices prospective for first quarter, since increased steel and wage costs are not being absorbed at current price levels.

Rars

Urgent small-lot orders are being placed by motor car manufacturers for shipment this week. Most mills will be inactive until Dec. 26, when schedules will be resumed and gaited to meet accumulated requests for shipment during the final week in December. Volume has progressively im-proved since October, and, in most cases, bar mills expect December to reflect the greatest gain. Heavier motor car assemblies in January are expected to stimulate a sharp improvement in bar demand, since stocking at most automotive centers has not been in evidence during fourth quarter. Miscellaneous tonnage is holding its

Cold-Finished Bars

Specifications are under the temporary spell of the holiday lull. Generous

releases are in prospect immediately after Christmas Day, and most cold finishers expect to finish the year with good operating schedules. Aside from good prospects for increased automotive tonnage in January, an accumulated demand from jobbers is expected to be translated into orders after the turn of the year. Movement out of warehouse in 1934 has, in some cases, increased as much as 50 per cent over that in the preceding year. No general restocking movement among jobbers has been in evidence in recent months. Hence, replenishment is considered imminent.

Reinforcing Steel

Although demand is seasonally dull, it is more encouraging than it was at this time last year. Contracts for road construction, while not offering immediate advantage to mills, at least sustains hopes for increased activity next spring. Private capital shows signs of thawing, and specifications for small private projects are more frequent. The J. A. Jones Construction Co., Charlotte, N. C., is low bidder on a housing project in Atlanta that will take about 1000 tons.

Plates and Shapes

Activity in this market is diminishing with the approach of the year end. The McClintic-Marshall Corpn. is low bidder for the construction of a pipe line at the Fort Peck, Mont., dam, which will require about 300 tons of fabricated plate. Structural inquiries are featured by 2200 tons for pier No. 45, New York. A small number of new State bridges appeared last week, while lettings were limited.

Tubular Products

This market, which has contradicted seasonal expectations, has succumbed temporarily to holiday influences. Despite the interruptions, December tonnage is expected to match that for November in most cases. Prospects for sustained demand in the new year are good. The major oil companies' plans for drilling augur well for drill pipe, casing and tubing. Increased drilling in California and the Gulf States is included in present plans. About 10,000 wells in the east Texas field are being mentioned in optimistic forecasts for next year. The movement of mechanical tubing has been accelerated by increased motor car requirements.

Wire Products

Demand for industrial wire from automotive centers has held up fairly well, despite the holidays, and a steady movement for such consumption is in store for the final week in December. Jobbers are deferring specifications until after inventory-taking and will undoubtedly participate more actively in January. Agricultural items likewise face a prospective expansion in demand in first quarter.

Sheets

While aggregate volume has shrunk in consequence of holiday retrenchment, the pressure upon mills for shipment during the final week in the year is expected to be quite severe. Mills relying on automotive tonnage for the largest share of their rolling schedules will particularly be pressed for shipments. Some orders for auto body sheets have been placed for urgent dispatching on Dec. 26. Some mills with fabricating subsidiaries have been shipping the bulk of recent production to such outlets in order to release sufficient capacity later to meet an expected increase in general demand in first quarter.

Tin Plate

Production has suffered from holiday interruptions, and general resumptions on the day after Christmas will permit an average output for the week at less than 35 per cent. General specifications are in satisfactory volume and shipments after the first of the year are expected to be fairly regular. Although there are no definite figures available, it is generally believed that consumer stocks of tin plate at the outset of the new year will show a drastic reduction from the carryover at the beginning of 1934. That is the brightest spot in the forward outlook.

Strip Steel

Holiday shutdowns among strip mills in some cases will be for only 24 hr. Automotive releases for shipments after Jan. 1 require fairly steady hot rolling schedules during the remainder of this year. Additional heavy releases for motor car consumption are momentarily expected, and January schedules will probably tend gradually higher. Owing to holiday recesses this week, output for the strip industry will probably average below 30 per cent.

Coke and Coal

Activity in the fuel markets has been retarded by the holidays. The movement of domestic coke out of wholesale yards is noticeably lighter, while shipments of foundry coke are only for urgent needs. Industrial sizes, including heating coke, are not active. Inventories are generally depleted, however, and a continued upswing in industrial activity in January would probably be translated into an increasing demand for fuels.

Scrap

Practically all consumers have withdrawn from the market for the holiday period. A lack of buying has caused a sympathetic softness in prices, and dealers with short orders are able to cover more freely. The market is bare of any significant negotiations, however, and prices remain unchanged. More active consumer participation after the middle of January is expected.

St. Louis Market More Active

ST. LOUIS, Dec. 24.—Mills are expecting a heavy buying movement of structural shapes to develop after the turn of the year. In addition to the tonnages required for projects awarded during November and December to general contractors, who have been slow in placing the steel, it is expected that new jobs, such as State highway bridges and other public work, will develop early in 1935 to make the first quarter outstanding. In the meantime buying is light, in accordance with the time-honored custom of keeping inventories low.

The rail situation is unfavorable so far as lines centering here are concerned. These roads still have unlaid rails previously bought and, it is understood, have made no plans so far for any purchases in 1935.

A strong buying movement in pig iron is expected shortly after the turn of the year, and sellers are more optimistic than they have been for some time. Selling during the last week has been fairly heavy. Shipments for December probably will equal November, despite the aim of melters to hold down inventories as much as possible. A most bullish feeling is said to exist among the implement manufacturers in and around Moline, Ill., and in Peoria, who are planning to operate at 100 per cent capacity after the first of the year. The stove trade is experiencing a seasonal slack, although not so much as usual, and several large plants in the Belleville district intend to operate their plants through the holidays without any cessation of

Additional advances in dealers' scrap prices were recorded during the last week. Dealers are covering on contracts. Although there was no new buying by industries, it is understood that deals are pending for purchases to be made after the turn of the year. No. 2 heavy melting steel and No. 1 locomotive tires are up 25c. a ton; rails for rolling, cast iron carwheels and railroad malleable are 50c. higher, and steel car axles advanced 75c.

Prospects for 1935 Bright on Coast

SAN FRANCISCO, Dec. 24. — Increased activity during the closing days of 1934 strongly indicates a steady upturn in business for the coming year. During the week orders were placed for 3628 tons of structural steel and 1183 tons of reinforcing bars. Approximately 700 tons of structural steel, 1618 tons of reinforcing bars and over 1000 tons of cast

iron pipe are included in projects on which bids will be opened shortly.

At Oakland, Cal., an award of 2300 tons of structural steel for the Alameda County court house has been recommended to Pacific Coast Steel Corpn. Approximately 930 tons of reinforcing bars will be purchased by the general contractor. Pacific Coast Steel Corpn. also took an additional 500 tons of reinforcing bars for the George Washington school at San Francisco, as well as 222 tons of structural steel on two other projects. Soule Steel Co. will furnish 187 tons of reinforcing bars for a school at Sebastopol, Cal.

Awards on several major projects are expected shortly. Consolidated Steel Corpn. is low bidder on the Malheur River and Dead Ox siphons, which forms a part of the Owyhee River project in Oregon. Specifications call for approximately 4200 tons of plates. The general contract for the Coast Guard bulkhead at Government Island, Cal., should be placed shortly, and 3000 tons of sheet piling will be booked. A number of projects calling for up to 500 tons will increase awards within the next 30 days.

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A check of steel companies on the Coast shows a substantial increase in bookings during the year and a general confidence for even greater improvement during 1935. The reappearance of private construction is significant of the better trend.

Additional PWA Loans Announced

WASHINGTON, Dec. 24. — Announcement has been made by Harold L. Ickes, public works administrator, that he had given permission to Bayonne, N. J., to use \$475,000 out of a loan and grant of \$600,000 for paving Broadway between Tenth and Fifty-fifth Streets. The \$600,000 allotment originally was made for replacing about four miles of twin steel water supply mains. After receiving the allotment the city modified its plans and asked for permission to use \$475,000 for improvements on Broadway. The water supply project, as modified, calls for installing 2500-ft. of cast iron supply line across the Kearney meadows.

Among other new loans and grants announced by the PWA are the following:

Columbus, Ohio, \$320,000, grant, for power house.

Long Beach, Cal., \$402,000, loan, for hospital building; \$111,200, loan and grant, school.

Torrance, Cal., \$170,000, loan and grant, water system.

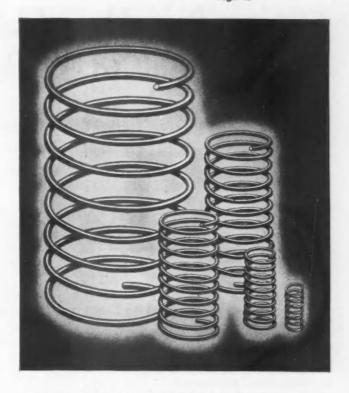
Norfolk, Va., \$100,000, loan and grant, gymnasium.

Why these Springs can now be made **Zinc-Coated Wire**

Bethanizing, the new process of coating wire with zinc, has opened the way to make articles formerly made of galvanized wire better and more enduring. In addition, it has made possible the manufacture from zinc-coated wire of many products formerly made from expensive alloys.

Springs for pump valves and similar uses are a case in point. Older processes of galvanizing could not apply a coating heavy enough to give adequate protection against rust. And the coating would crack from the forming operations and the constant flexure in service.

Now Bethanizing makes it possible to use steel, with its superior physical properties, in making these springs. A heavy 2.4-oz. Bethanized coating affords ample protection against corrosion. The Bethanized



coating is so flexible that the bending in manufacture, the flexure in service, will not cause it to crack or flake.

This is but one of numerous cases where the use of Bethanized Wire has simplified manufacturing processes and resulted in a superior product. A few other interesting examples of products now made of this new zinc-coated wire are given on this page.



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Industrial chain-link, park, station and farm fence make full use of all of the improvements brought by the Bethanizing process: Heavier coatings that greatly increase life; no cracking of the coating in weaving; lasting fine appearance.

Bethanized Wire, with its smooth, silvery finish, makes an excellent material for spokes in the wheels of baby carriages, tricycles and similar wire-wheeled vehicles. The fabricating operations do not damage the coating.



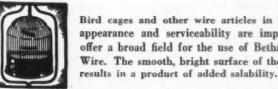
Bird cages and other wire articles in which appearance and serviceability are important offer a broad field for the use of Bethanized Wire. The smooth, bright surface of the wire



For telephone and telegraph service, Bethanized Wire offers the advantage of a coating that can be put on as heavy as the conditions call for. Higher tensile strength can be provided than is possible in wire coated by the hot-dip process. Bethanized Wire splices without surface cracks.

The service life of strand can be much increased by making it of heavily-coated Bethanized Wire. Thick Bethanized coatings stand being woven into strand without damage. Abuse in erection will not cause cracks that offer places for rust to start.







In screen wire the heavier coatings which Bethanizing makes possible are especially useful as, under the abrasive action of the material being screened, the life of a coating is about proportional to the thickness. A 2.4 oz. Bethanized coating lasts about three times as long as the usual hot-dip galvanizing.



WIRE- PRODUCT OF BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

District Offices: Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Washington, Wilkes-Barre, York. Pacific Coast Distributor: Pacific Coast Steel Corporation, San Francisco, Seattle, Los Angeles, Portland, Honolulu. Export Distributor: Bethlehem Steel Export Corporation, New York.

Chicago Rate Up a Half Point to 37 Per Cent



Further Gain Due After the Holiday— Pig Iron Shipments Show Marked Gain Over November—Scrap Buoyant

HICAGO, Dec. 24.-Steel production has risen one-half point to 37 per cent of capacity. Plans for further open-hearth expansion are being deferred until the day after Christmas. Because of the holiday, shipments this week will be curtailed, but the significant thing is that the rate of operations will continue its upward path right to the end of De-These favorable conditions are brought about for the most part by demands from automobile manufacturers, who are steadily lengthening their stride. Nevertheless it must not be overlooked that miscellaneous demand is better and major industries, such as the farm equipment builders, stove manufacturers, trac-tor and road building machinery plants, are losing no part of the gains recorded earlier in the month.

The recovery picture is clouded by uncertainty as to railroad buying and the fact that construction programs are light and projects are scarce notwithstanding the support the Government is attempting to give.

All price structures remain firm, but many consumers are keeping close watch on the moves that NRA will take in regard to price control.

Dealers in scrap are pushing up their bids for railroad materials and the general belief here is that scrap prices will move to higher levels. Snow and cold weather are restricting shipments, which are also held back by yard dealers' unwillingness to sell in a rising market.

Pig Iron

December shipments show marked improvement over the November volume, and releases for January are coming in fast. Notwithtanding this interest in immediate needs, there is little disposition on the part of consumers to enter contracts. Many jobing foundries are down for the year-end period, but many automobile plants will go down only for Christmas Day.

Bars

Bar mills are dividing honors with sheet units as being responsible for most of the recent gains in ingot output. In new business and shipments bar products are far in the lead of other heavy tonnage products and from all indications this situation will prevail through most of January. Automobile plants continue to add to their requirements, and miscellaneous orders are coming in more freely. The farm implement industry is planning on heavier schedules, and its prospects in 1935 are considered to be the best in at least three years.

Plate:

The year draws near its close with very little of promise in the v'ay of plate tonnages. In fact, at the moment about the largest business that mills see ahead of them is made up of the tonnages that will go into structural members for use in dams across the Mississippi River. Railroad programs are still being held in the dark except for a tentative repair program that may be undertaken by the Burlington.

Structural Material

This market is quiet except for prospective tonnage in Mississippi River dams and in miscellaneous highway bridge work. The R. C. Mahon Co. will fabricate the steel for the Muscatine, Iowa, dam and Mc-Clintic Marshall Co. is low bidder on the Winona, Minn., dam. Both Illinois and Wisconsin have active bridge jobs out for figures. Alternate bids on a viaduct in Iowa show that structural steel is 20 per cent lower in price than is reinforced concrete.

Reinforcing Bars

The holiday period is usually dull in reinforcing bars and this year is no exception. However, some attractive tonnages are being carried over into the new year. The Milwaukee filter plant, requiring 4000 tons, should come up for final action early in January. Prospects are improved for early resumption of work on the Outer Drive in Chicago. The Sanitary District is now calling for bids on contract No. 2 which will take 1000 tons of bars. A water plant at Michigan City, Ind., calls for 500 tons. The general contract for the Des Moines, Iowa, post office was let Dec. 18, and shops are looking for early placement of the 350 tons of bars.

Cast Iron Pipe

Seasonal dullness hangs over this market and most current business will be carried over into the new year. Chicago has ordered 100 tons of 6-in. pipe from Glamorgan Pipe & Foundry Co. All other orders are of carlot proportions. Jackson, Mich., is sending out plans for a new sewage treating plant which may take as high as 250 tons of pipe and fittings.

Rails

Chicago rail mills remain idle and have books that probably establish a record low. Prospects for a rail buying movement are obscure.

Sheets

Shipments are climbing fast as automotive users expand programs on assembly lines. There is also heavier demand for barrel stock and in some directions miscellaneous consumption is gaining. The net result is that output is mounting and there will be no drop in shipments over the holiday period. It is not at all improbable that at least one unit will be operating at capacity soon after the turn of the year.

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Hot-Rolled Strip

Shipments are moving upward as automobile frame plants expand operations which will reach new heights early in the new year.

Wire Products

New orders are coming in more freely from manufacturers and indications point to steady shipments during the remainder of this year. Production of wire and wire products is being stepped up, the average now being close to 35 per cent of capacity. At this rate no tonnage is being added to mill stocks. Most business is being placed for nearby requirements and there is little nibbling for first quarter contracts. The jobbing trade is quiet, which is the usual thing at this time of year. However, lack of jobber interest in first quarter contracts is disturbing to producers. The outlook in farm areas remains good and sellers are hopeful that railroad business will develop in the spring.

Scrap

Prices are holding all gains and dealers have lost none of their zest to push quotations to still higher levels. Railroad offerings of heavy melting steel have reached a new high at close to \$11.75 a gross ton, delivered, and there is a noticeable move on the part of railroads to restrict lists and thereby play into higher markets that are expected in January. Cast iron borings are active, while on the other hand rerolling rails are very quiet. Stocks at docks along the shores of Lake Michigan are expanding, this being especially true at Milwaukee. Shipments are somewhat crippled by December snows, which have set an all-time record.

44-The Iron Age, December 27, 1934

Steel Demand Holds Its Own in New York District



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Volume of Spot Orders Shows Little
Diminution, Though Contracting Is Light

— Foreign Competition Is Disturbing

EW YORK, Dec. 24.—The holiday season has not checked the demand for finished steel for prompt shipment. While bookings have failed to make further gains, they have shown little, if any, recession, and total commitments for the month promise to exceed those of November by a comfortable margin. Demand is of a miscellaneous character and is prompted mainly by replenishment requirements, contracting being relatively light.

No new large tonnages in heavy rolled products have come into the market. The New York Central has asked for Clayton Act bids on an indeterminate tonnage to cover its first quarter needs. The steel for the Tygart River Dam, Grafton, W. Va., comprising 1600 tons of piling, 1400 tons of reinforcing bars and 400 tons of structural shapes, may be placed shortly. Frederick Snare Corpn., New York, is the general contractor.

The largest private piling order in this district in months, about 800 tons, has been placed with a German mill. Jobbers in this area are becoming increasingly disturbed by the competition of foreign steel. European bars were recently laid down in the local harbor at 1.74c. a lb., duty paid. The waiving of extras on foreign steel is as disconcerting as the low base prices that are frequently quoted. The situation in the local pipe jobbing field is also upset because of occasional inconsistencies in resale prices growing out of purchases from domestic mills that do not belong to the steel code.

Reinforcing Steel

A sizable amount of business is pending for highway construction, but general contractors are not expected to distribute awards until after the turn of the year. Around 1000 tons for a housing project in Baltimore should come out soon, and New Jersey and New York highway and bridge projects, totaling close to 2000 tons, will probably reach steel distributers during the next two weeks. Awards during the past seven-day period consisted of 200 tons of mesh for a highway in Delaware County, N. Y., to American Steel & Wire Co., and 150 tons for a Rhode Island highway to the same distributer.

Pig Iron

A few foundries appear to be securing a little more business, but aggregate foundry melt is still spotty and only slightly better than last month. Due to the holidays the week's business amounted to only 1800 tons, as compared to 2400 tons in the preceding seven-day period and 2800 tons booked two weeks earlier. The A. P. Smith Co. at Orange, N. J., awarded 300 tons of foundry iron to two domestic furnaces. Several other smaller inquiries have not as yet been placed. There is a general expectation among jobbing foundries that better business will materialize early in the new year. On this basis, furnace representatives believe that first quarter shipments will rise well above the total for the present quarter.

Scrap

This market is marking time because of the holiday period. However brokers are still purchasing steel in moderate quantities to build up accumulations in preparation for incoming boats. Domestic melters are displaying even less interest than usual because of the approaching inventory period. It is expected that both the domestic and foreign markets will lag considerably until early in January. All prices are unchanged from a week ago, and, although the tone of the market has lost some strength, there is no appearance of weakness.

Scrap Prices Firmer At Boston

BOSTON, Dec. 24.—With supplies of desired grades of scrap growing rather scarce, local prices have become firmer. Offers for No. 1 heavy melting steel for Pennsylvania delivery have been raised from \$6.80 a ton, f.o.b., to \$7, and in at least one instance to \$7.25, but very few actual sales are recorded. Exporters are paying \$8.25 to \$8.50 a ton, delivered local army base, for such material, and \$7.25 to \$7.50 for No. 2 steel, with No. 2 constituting the bulk of business. Exporters have a considerable tonnage for Japan under contract and indications are there will be a

scramble to buy after Jan. 1, with resulting price advances. Little interest is shown in other kinds of scrap, but prices all down the list are very firm due to limited offerings.

Comparatively little pig iron has been sold, but a moderate number of shipping instructions have been received by furnace interests, which will close 1934 with contracts virtually cleaned up. The General Fire Extinguisher Co., Providence, R. I., is in the market for 700 tons, part No. 1X and part No. 2X, but there are no other open inquiries and very few private ones. Buffalo furnace representatives expect further competition from Dutch iron, if the report is true that 1000 tons will be stored on the Mystic wharf, here, to care for trucking and other small orders.

Buffalo Rate Is Higher

BUFFALO, Dec. 24.—After shutting down over Christmas Day, the Lackawanna plant of Bethlehem Steel Corpn. will resume on Wednesday with nine open-hearths in operation, an increase of one over the figure the latter part of last week. Republic Steel Corpn. has five open-hearths in operation, and Wickwire Spencer Steel Corpn., one. The Seneca sheet division of Bethlehem has stepped up to about 25 per cent of capacity as against 15 per cent the previous week.

It is reported here that the 1300-ton river bridge near Vestal, N. Y., has been contracted for, with the award going to the American Bridge Co. The 250-ton State bridge job at Unadilla, N. Y., is said to be still unplaced.

Pig iron producers are more hopeful concerning future business than they have been at any time in years. They assert that inventories are low and there are indications of a good buying movement some time after the first of the year. There is less timidity about placing business than there has been in the last six months. Some fairly sizable lots, running around 500 tons or so, have been placed. Shipments, despite the holiday period, continue to hold up.

Scrap continues strong. It is possible to get \$13.50, Steubenville, for new hydraulic compressed sheets, though this seems to be the only material that can be shipped out of Buffalo at a profit. The dealers' market, particularly for No. 2 heavy melting steel, is exceptionally strong, though it is generally denied that a new order is out.

Electric Controller & Mfg. Co., Cleveland, has been awarded a contract for controllers, brakes and limit switches for the auxiliary drives on the new 44-in. blooming mill and 56 in. continuous hot strip mill now under construction by the Ford Motor Co.

Steel Output up Two Points To 56 Per Cent at Cleveland



Holiday Interruption Held to a Minimum— Orders from Automotive Industry, Mostly for Prompt Shipment, Have Been Heavy

LEVELAND, Dec. 24. - With a good volume of specifications in finished steel on their books, mostly for material for early shipment, steel plants in the Cleveland-Lorain territory limited their suspension of operations in their open-hearth and finishing departments to one day, Christmas day, and one company, the Otis Steel Co., did not shut down its semi-finishing department for the holiday. This company, instead, added another open-hearth furnace, raising the rate of operations in the Cleveland-Lorain territory two points to 56 per cent of capacity.

Business in finished steel continued in good volume until the end of last week, when there was a slowing down as was to be expected over the holiday period. Orders were largely for sheets, bars and strip for the automotive industry, and consumers generally want shipments as promptly as possible. With the automobile manufacturers getting into good production not much recession in orders for steel is expected during the closing days of the year. Activity in the construction field is light, and not much new demand is expected until new appropriations are made for public work.

Pig Iron

Foundry melt has increased this month in the northern Ohio territory, which is a reversal of the usual December trend. The improvement is spotty. While some foundries are much busier than recently, others report no improvement. A northern Ohio sanitary ware manufacturer has just installed a third cupola and is operating 24 hr. a day. In sales and shipments pig iron is maintaining its recent improvement. One Lake furnace interest sold 10,000 tons during the week. Silvery iron, which has been very dull, is showing more life in carlot sales.

Bars, Plates and Shapes

Demand for steel bars, which is largely from automobile parts makers, continues heavy. High-carbon steel bars have been active, the demand being stimulated by orders for makers of automobile tool kits. The United States engineers, Zanesville, Ohio, will take bids Jan. 7 for 1000 tons of reinforcing bars for five dams for the Muskingum River conservancy district. Specifications call for either new billet or rerolled bars. Previous information was given out that bidding would be restricted to new billet steel. Bids for two of the dams will be taken in January. Contracts for three of the dams were placed recently. Bids will be taken later for roller and sliding gates. Stainless steel will be used in the construction of the sliding gates. For replacing bottoms in five car dumpers at Great Lakes ports 100 tons of abrasion-resisting steel has been placed.

Sheet

Demand from the automotive industry continues to increase. Orders aggregating quite a large tonnage were placed during the week by the Chrysler company and by some of the General Motors units, including Fisher Body plants. Early shipment is called for in most cases. Miscellaneous business shows a broadening tendency. Demand from makers of washing machines has improved.

Strip Steel

A good volume of business was placed during the week by plants in this territory making automotive stampings. Liberal specifications are being issued by parts makers affiliated with motor car companies against recent orders, although not much new business came from these plants the past week. Miscellaneous demand is not very active.

Wire Products

Demand for manufacturers' wire from the automotive industry has increased considerably, and bolt and nut manufacturers are buying more liberally than for some time. Nails also are moving somewhat better, although jobbers are ordering only for immediate needs, as they wish to keep their stocks low at inventory time.

Bolts and Nuts

Orders in substantial volume are coming from the motor car industry, and there is a gain in the demand from railroads, jobbers and other sources. Considerable of the increased business is doubtless due to the 10 per cent price advance, which does not become effective until Jan. 1 for consumers now under contract. Following a customary practice, makers are complying with the request of some buyers to defer shipments until after Jan. 1 in order to keep their inventory low at the first of the year.

Scrap

An easier tone has developed following the buoyancy that was aroused by the recent heavy buying in outlying districts. While the recent price advances are being maintained, dealers with orders are having less difficulty to buy scrap at these prices. No new consumer buying is expected before January. A sale of 500 tons of cast iron carwheels at \$12 was made during the week by one of the railroads that handles its scrap sales here.

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Mills at 50 Per Cent In Southern Ohio

CINCINNATI, Dec. 24.—Approach of the holiday and inventory period depressed sheet bookings during the past week to about 50 per cent of mill capacity. The easing of demand was entirely from the automotive industry, other users sustaining a steady interest in covering current needs. Orders are not large, consumers generally preferring to enter the market at more frequent intervals to cover their needs. Production of the leading district interest averaged 75 per cent of capacity last week, and advance schedules for this week, despite the holiday, indicate a 50 per cent rate.

The pig iron market lacks color. While average weekly sales are adhering stubbornly to recent higher levels, demand is without sufficient buoyancy to sustain optimistic feeling. Here and there, however, foundries report slightly improved melt.

All grades of coke are in improved demand, but users of foundry sizes are reluctant to order beyond 30-day needs.

The scrap market is reacting solely to dealer demand. Prices have moved upward again despite the total absence of mill buying in substantial quantities. Speculative purchases are swelling yard supplies and distress material is lacking.

Hydraulic Bundles Up at Detroit

DETROIT, Dec. 24.—Hydraulic bundles have advanced 50. a ton in the past week and are now quoted at \$9.50 to \$10, or \$1 a ton higher than heavy melting steel. Sheet clips also are up 50c. The entire market is strong at current levels, with indications of further price increases after the first of the year.

Philadelphia District Steel Output Rises to 26 Per Cent



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Holiday Fails to Interrupt Expansion in Production, as Demand for Steel Is Unabated—Scrap Market Continues Strong

PHILADELPHIA, Dec. 24.—Even the holidays have failed to interrupt the rise in demand for steel products in this territory. Orders this morning were well up to the recent average, and, in view of the urge for immediate shipment which accompanies almost all commitments, no curtailment is expected over the remainder of the week. Mills will start up on Wednesday or Thursday to roll accumulated orders and some of them will be busy through Saturday.

Open-hearth furnaces will not operate on Christmas day, which is a recognized holiday in the industry, but will make steel over the remainder of the week. One independent plant which has been operating only one furnace for several weeks has put on another and the leading interest will probably step up production before the end of the week. The district steel producing rate has risen one point to 26 per cent of capacity, the highest level since midsummer.

Orders from the automotive body plants in the district are increasing, but do not account for all of the increase in output. Miscellaneous demand for plates and shapes is expanding gradually and a number of moderate-sized jobs have appeared to help mill order books. The railroads have also been more active takers of steel, although no orders for rails or freight cars are in prospect.

Pig iron demand continues rather quiet, but is expected to expand rather rapidly after the turn of the year. The scrap market is strong, although prices are supported largely by export demand. Brokers have been forced to advance their offering prices for scrap steel to be shipped abroad.

Pig Iron

This market is not as active as that for finished steel, although December orders are running at least 25 per cent ahead of those in the previous month. Foundry operations have been reduced because of the holiday this week and buyers are anxious to keep inventories at a minimum. After the first of the year buying is expected to reach more interesting proportions, as only the larger users have sufficient iron on their yards to continue operations at recent levels.

Bars, Plates, and Shapes

Miscellaneous demand for the heavy hot-rolled products has been increasing gradually over the past several weeks without the benefit of any outstanding jobs. The backlogs of structural fabricators are fairly ample, even though no new work of consequence has appeared in recent weeks. Boiler makers are more active and shipyards will soon benefit by orders from the railroads. The Bethlehem Shipbuilding Co. was low bidder on two coal barges for the Pennsylvania, calling for 500 tons, but the awards have not been made. The Erie has also taken no action on a ferry boat on which bids were taken last week. The Reading will take shipments immediately after the first of the year on plates for car repairs, placed last week. Plate shipments to Navy yards are also expected to be stepped up at The week's structural that time. awards include a number of moderatesized jobs, and new inquiry is also without feature. Bars are quiet, although highway work continues to absorb a fair tonnage.

Sheets

Automobile stamping plants in the district are placing orders regularly and will step up production more rapidly in January. Other large consumers of flat-rolled steel are inactive, but miscellaneous demand is improving. Jobber buying, particularly, is becoming more of a factor, indicating that the recent business recovery is well distributed.

Scrap

Brokers buying scrap for export have advanced their prices 25c. a ton, to \$9 and \$10 respectively for the No. 2 and No. 1 grades. Little material is coming out, even at the higher prices. Domestic users are showing little interest in the market, but are expected to become more active after the first of the year. The foundry grades are quiet, as iron melters are in the dull season of their year.

Black Shapes for Cruisers Awarded

W ASHINGTON, Dec. 24.—The Bureau of Supplies and Accounts has awarded by lot 846 tons of black

shapes for the two new cruisers to be constructed under the new building program. The tonnage was distributed as follows: Inland Steel Co., 300; Carnegie Steel Co., 223; Bethlehem Steel Co., 152; Phoenix Iron Co., 105; Jones & Laughlin Steel Corpn., 63; J. T. Ryerson & Son, Inc., 50; Illinois Steel Co., 3. The galvanized lots included in the same schedule as the black shapes have not been awarded.

Award also has been made by lot for 412 tons of plates for the cruiser Wichita, 264 tons going to the Illinois Steel Co. and 148 tons to the Worth Steel Co.

The Bureau of Supplies and Accounts, Navy Department, will open bids Jan. 4 on 112 tons of shapes for the cruiser Wichita, to be built at the Philadelphia Navy Yard. On Jan. 11 the bureau will open bids on 497 tons of rivet steel for stocks at various navy yards.

Holiday Recession In South

BIRMINGHAM, Dec. 24.—Demand for pig iron and steel products has been receding since the middle of the month on account of the holiday season, and not much business is expected until after the turn of the year. There is a hopeful feeling, widely prevalent, that January will bring an upturn in both pig iron and steel.

There was an increase of one in blast furnace operations last week, and the active total is now six, with the Tennessee company furnishing three, and Woodward Iron, Sloss-Sheffield and Republic Steel, one each.

On Dec. 20 Ensley No. 5 stack of the Tennessee company, banked for some months, was placed in production as a result of a slip of its charge. It is planned to operate this stack for a short time and rebank.

The Ensley rail mill was closed on Dec. 17, after nine days' operation, and there are no immediate plans for resumption.

Seven open-hearth units operated last week and the same number will be worked this week.

Pipe shipments have also been affected by the holidays, and it is likely that the December movement will be about 20 per cent less than in November. In the last several weeks new awards have been of small size. Bids on several projects have exceeded the amount available and new bids will have to be asked. New Orleans is asking bids on about 1000 tons on Dec. 27, and on 2000 tons Jan. 10.

A better feeling seems apparent in the scrap market. Lately there have been more inquiries and the potential tonnage demand is larger than in some time.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES	Steel Sheet Piling
	Na.
Iron and Steel Bars Sell Siesi Base per Lb.	F.o.b. Pittsburgh F.o.b. Chicago F.o.b. Buffalo
F.o.b. Pittsburgh	F.o.b. Buffalo F.o.b. rars dock Gulf ports F.o.b. cars dock Pacific ports
F.o.b. Pittsburgh	F.o.b. cars dock Pacific ports
F.o.b. Chicage 1.85c. F.o.b. Gary 1.85c. F.o.b. Duluth 1.95c. Del'd Detroit 1.95c. F.o.b. Chicage 1.95c.	SHEETS, STRIP, TIN PI
F.o.b. Cleveland	TERNE PLATE
F.o.b. Buffalo	Sheets
F.o.b. Birmingham1.95c.	Hot Rolled
F.o.b. Birmingham	
Rall Steel	No. 10, f.o.b. Pittsburgh No. 10, f.o.b. Gary No. 10, del'd Detroit No. 10, del'd Philia No. 10, f.o.b. Birmingham No. 10, f.o.b. dock rars Pacific ports
(For merchant trade)	No. 10, del'd Phila.
Pak Bittshungh 170s	No. 10, f.e.b. dock mars Pacific
F.o.b. Chicago	
	Hot-Rolled Annealed
F.o.b. Buffalo	No. 24, f.o.b. Pittsburgh No. 24, f.o.b. Gary
F.o.b. Buffalo 1.80c. F.o.b. Birmingham 1.85c. F.o.b. cars dock Gulf ports 2.10c. F.o.b. cars dack Facilic ports 3.25c.	No. 24, f.o.b. Pittsburgh No. 24, f.o.b. Gary No. 24, del'd Detroit No. 24, del'd Phila.
	No. 24, del'd Phila. No. 24, f.o.b. Birmingham No. 24, f.o.b. dock cars Pacific
Billet Etwel Reinforcing	No. 24, wrought iron, Pittsburgh
Straight lengths as quoted by distributers) P.o.b. Pittaburgh 2.05c. P.o.b. Chicago 2.10c. P.o.b. Gary 2.10c. P.o.b. Gary 2.10c. P.o.b. Cicevaland 2.20c. P.o.b. Cicevaland 2.10c. P.o.b. Voungstown 2.10c. P.o.b. Birmingham P.o.b. Birmingham 2.10c. P.o.b. Birmingham P.o	
F.o.b. Chicago	Heavy Cold-Rolled
Del'd Detroit	No. 10 gage, f.o.b. Pittsburgh No. 10 gage, f.o.b. Gary No. 10 gage, del'd Detroit No. 10 gage, del'd Phila No. 10 gage, f.o.b. Birmingham No. 10 gage, f.o.b. dock ears Paci
F.o.b. Youngstown	No. 10 gage, del'd Detroit
F.o.b. Birmingham	No. 10 gags, f.o.b. Birmingham.
F.o.b. cars dock Gulf ports2.45c. F.o.b. cars dock Pacific ports2.45c.	porta
	Light Cold-Rolled
Rail Steel Reinforcing	No. 20 gage, f.o.b. Pittsburgh No. 20 gage, f.o.b. Gary No. 20 gage, del'd Detroit No. 20 gage, del'd Phila No. 20 gage, f.o.b. Birmingham No. 20 gage, f.o.b. dock cars Pacl
(Straight lengths as quoted by distributers) F.o.b. Pittsburgh	No. 20 gage, I.o.b. Gary No. 20 gage, del'd Detroit
F.o.b. Chicago	No. 20 gage, del'd Phila No. 20 gage, f.o.b. Birmingham
F.o.b. Cleveland	No. 20 gage, f.o.b. dock cars Paci
F.e.b. Buffalo	Galvanised Hanels
Straight Sengths as quoted by distributers F.o.b. Pittsburgh	
P.O.O. Cate uses Latino potes	No. 24, f.o.b. Pittsburgh No. 24, f.o.b. Gary No. 24, del'd Phila. No. 24, f.o.b. Birmingham No. 24, f.o.b. dock cars Pacific
Iron	No. 24, f.o.b. Birmingham
F.o.b. Chicago 1.89c. F.o.b. Terre Haute, Ind. 1.75c. F.o.b. Louisville, Ky. 2.10c. F.o.b. Danville, Pa. 1.80c. F.o.b. Berwick, Pa. 1.70c.	No. 24, 1.0.5. dock cars Pacine ports No. 24, wrought iron, Pittsburgh.
P.o.b. Louisville, Ky	
F.o.b. Berwick, Pa	Long Ternes
Cold Finished Bars and Shafting*	No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh
Base per Lb.	F.O.O. cars dock Pacine ports
F.o.b. Pittsburgh 2.10c. F.o.b. Chicago 2.15c. F.o.b. Glary 2.15c. F.o.b. Glary 2.15c. F.o.b. Cloveland 2.15c. F.o.b. Buffalo 2.20c.	Vitreous Enameling Stock
F.o.b. Gary	No. 20, f.o.b. Pittsburgh
F.o.b. Buffalo	No. 28, f.o.b. Pittsburgh
F.o.b. Buffalo 2.20c. Del'd Detroit 2.30c. Del'd castern Michigan 2.35c.	No. 28, Gary No. 28, cars dock, Pacific Coast
* In quantities of 10,000 to 19,000 lb.	ports
Pence and Sign Posts	Tin Plate Per
Fence and Sign Posts Angle Line Posts Base per Not Ton F.o.b. Pittsburgh \$50.00 F.o.b. Chicage 51.00 F.o.b. Duluth F.o.b. Duluth 51.00 F.o.b. Duluth F.o.b. Duluth 51.00 F.o.b. Duluth 51.00 F.o.b. Duluth F	Standard cokes, f.o.b. P'gh distr
F.o.b. Pittsburgh\$50.00	Standard cokes, f.o.b. Gary
F.o.b. Chicago	Pacific ports
F.o.b. Cleveland 50.00	Terne Plate
F.o.b. Houston, Orange, Beaumont,	(P.o.b. Pittsburgh)
F.o.b. Calcage 50.00 F.o.b. Cloveland 51.00 F.o.b. Cleveland 55.00 F.o.b. Houston, Orange, Beaumont, Galveston 59.00 F.o.b. Mobile 58.00 F.o.b. New Orleans, Lake Charles, Corous Christi 59.00	(Per Package, 20 x 28 in. 8-lb. coating I.C
Corpus Christi	15-lb. coating I.C.
F.O.D. sars dock Pacific perts 63.00	20-lb. coating I.C. 25-lb. coating I.C. 30-lb. coating I.C.
Plates Base per Lb.	40-lb. coating I.C
P.o.b. Pittsburgh1.80c.	
F.e.b. Pittsburgh 1.80c. F.e.b. Chicago 1.85c. F.e.b. Gary 1.85c. Del'd Civeland 1.98c. F.e.b. Coatesville 1.99c. F.o.b. Sparrows Point 1.90c. Del'd Philadelphia 1.885c. Del'd New York 2.08c. F.o.b. Birmingham 1.95c. F.o.b. Brangham 2.20c. F.o.b. Brangham 2.20c.	Hot-Rolled Hoops, Bands, if and Flats under ¼ In
Del'd Cleveland1.985c.	Bas
F.o.b. Sparrows Point1.90c.	All widths up to 24 in., P'gh All widths up to 24 in., Chicago. All widths up to 24 in., del'd De
Del'd New York	All widths up to 24 in., del'd De
F.e.b. cars dock Gulf ports2.20c.	All widths up to 24 in., Birmingha
F.o.b. Birmingham 1.95c. F.o.b. cars dock Gulf ports 2.20c. F.o.b. cars dock Pacific ports 2.35c. Wrought iron plates, f.o.b. P'gh3.00c.	troit All widths up to 24 in., Birmingha Cooperage stock, Pittsburgh Cooperage stock, Chicago
Floer Plates	Cold-Rolled Strips
F.o.b. Pittsburgh	Ben
F.o.b. Contestille	F.o.b. Pittsburgh F.o.b. Cleveland Del'd Chicago
F.o.b. Pittsburgh 3.85c. F.o.b. Chicago 2.46c. F.o.b. 2.45c. 4.5c. F.o.b. cars dock Quif ports. 2.75c. F.o.b. cars dock Peafle ports. 3.96c.	P.o.b. Worcester
Structural Shapes Base per Lb.	No. 14, Pittsburgh or Cleveland.
F.o.b. Pittsburgh 1.80c. F.o.b. Chicage 1.85c. Del'd Cleveland 1.985c.	No. 14, Worcester No. 20, Pittsburgh or Cleveland. No. 20, Worcester
Del'd Cleveland	No. 20, Worcester
F.o.b. Bethlehem	Hot-Rolled Rail Steel St
Del'd New York	Bas
Der'd Cleveland 1.785e. F.o.b. Buffalo 1.90c. F.o.b. Bethlehem 1.90c. Del'd Philadelphia 2.005c. Del'd New York 2.0523c F.o.b. Birmingham (standard) 1.95c. F.o.b. cars dock Gulf ports 2.20c. F.o.b. cars dock Pacific ports 3.25c	F.o.b. Pittsburgh F.o.b. Chicago F.o.b. Birmingham
P.a.b. cars dock Pacific ports2.35c	F.o.b. Birmingham

	Steel Sheet Piling Base per Lb.
F.o.b. F.o.b. F.o.b. F.o.b.	Pittsburgh 2.15e. Chicago 2.25e. Buffalo 2.25e. rars dock Gulf ports 2.60e. cars dock Pacific ports 2.60e.
	HEETS, STRIP, TIN PLATE TERNE PLATE Sheets
	Hot Rolled
No. 1 No. 1 No. 1 No. 1 No. 1 No. 1	9, f.o.b. Pittsburgh . 1.85e. 9, f.o.b. Gary . 1.95e. 9, f.o.b. Gary . 1.95e. 9, f.o.b. Getroit . 2.95e. 9, del'd Detroit . 2.95e. 9, del'd Phila . 3.14e. 9, f.o.b. Birmingham . 2.09e. 0, f.o.b. dock rara Pacific ts
No. 2	
No. 2 No. 2 No. 2 No. 2 No. 2 Port No. 2	4, f.o.b. Pittsburgh 2,40c, 4, f.o.b. Gary 2,59c, 4, del'd Detroit 2,60c, 4, del'd Phila 2,99c, 4, f.o.b. Birmingham 2,59c, 4, f.o.b. dock cars Pacific 3,09c, 4, wrought iren, Pittsburgh 4,30c,
	Heavy Cold-Rolled
	0 gage, f.o.b. Pittsburgh 2.50c. 0 gage, del'd Detroit 2.10c. 0 gage, del'd Phila 2.10c. 0 gage, f.o.b. Birmingham 2.55c. 0 gage, f.o.b. Birmingham 2.55c. 0 gage, f.o.b. dock cers Pacific
	Light Cold-Rolled
No. 2 No. 2 No. 2 No. 2 No. 2 No. 2	0 mage, f.o.b. Pittsburgh
No. 94	Galvanized Shneis 1, f.o.b. Pittsburgh3.10c.
No. 24 No. 24 No. 24	f.o.b. Gary 3.29c. , del'd Phila. 3.39e. , f.o.b. Birmingham 3.25c. 4. f.o.b. dock cars Pacific 3.79e. 4. wrought iron, Pittsburgh 4.95c.
	Long Ternes
No. 2 f.o. F.o.b.	4, unassorted 8-lb. coating b. Pittsburgh
No. 2	6, f.o.b. Pittsburgh 3.10c.
No. 28 No. 28 No. 2 port	Tin Mill Black Plate 3, f.o.b. Pittsburgh 2.75c. 3, Gary 2.85c. 5, cars dock, Pacific Coast 5, 3.35c.
	Tin Plate Per Buse Box
Standa Standa	ard cokes, f.o.b. P'gh district \$5.25 ard cokes, f.o.b. Gary 5.35 ard cokes, f.o.b. cars dock 5.90 ific ports 5.90
	Terne Plate (P.e.b. Pittsburgh)
8-1b.	(Per Package, 20 x 28 in.)
25-lb. 30-lb. 40-lb.	coating I.C. 14.00 coating I.C. 15.25 coating I.C. 17.50
Hot	Rolled Hoops, Bands, Strips and Flats under ¼ In.
	diths up to 24 in., Pgh1.85c. diths up to 24 in., Chicago1.95c. diths up to 24 in., del'd De-
troi: All wi Cooper	dths up to 24 in., Birmingham 2.00c. rage stock, Pittsburgh2.10c. rage stock, Chicago2.20c.
	Cold-Rolled Strips Base per Lb.
F.o.b. P.o.b. Del'd F.o.b.	Pittsburgh
No. 1 No. 1 No. 2 No. 2	### Fewder Stuck 4. Pittsburgh or Cleveland 2.90c. 4. Worcester
	ot-Rolled Rail Steel Strips
F.o.b. F.o.b.	Bast per Lb. Pittsburgh

i illislied Ste
Base per Lb.
S, STRIP, TIN PLATE TERNE PLATE Sheets
Hat Rolled
Hot Rolles Base per Lb. 1.85c. 1.95c. 1.95c
b. Pittsburgh 2.40c. b. Gary 2.50c. l'd Detroit 2.60c. l'd Phila 2.69c. l'd Phila 2.69c. b. Birmingham 2.55c. b. dook cars Pacific 2.65c. cought iron, Pittsburgh 4.30c.
Heavy Cold-Rolled
re, f.o.b. Pittsburgh . 2.50c. r., f.o.b. Gary . 2.60c. re, del'd Detroit . 2.70c. re, del'd Phila 2.79c. rs, f.o.b. Birmingham 2.65c. rs, f.o.b. dock ears Pacific
Light Cold-Rolled
18. f.o.b. Pittsburgh
Galvanioed Sheets
b. Pittaburgh
ought iron, Pittsburgh 4.95c.
Long Ternes assorted 8-lb. coating
ttsburgh
b. Pittsburgh3.10c.
Fin Mill Black Plate b. Pittsburgh
Tin Plate Per Base Box okes, f.o.b. P'gh district okes, f.o.b. Gary
Tanna Dista
(P.e.b. Pittsburgh) r Package, 20 x 28 in.) ing LC. \$10.00 ing LC. 12.00 ing LC. 13.00 ing LC. 14.00 ing LC. 15.25 ing LC. 15.25
led Hoops, Bands, Strips Flats under ¼ In.
Base per Lb. up to 24 in., P'gh1.85c. up to 24 in., Chicago1.95c. up to 24 in., del'd De-
up to 24 in., Birmingham 2.00c. stock, Pittsburgh
Cold-Rolled Strips
burgh
ttsburgh or Cleveland 2.90c, orcester
olled Rail Steel Strips
burgh

		WI	RE	PI	ROD	UCT	S	
carload	d lo	ts,	f.o.	b.	Pitti	burgh	and	Cleve-
2	re :	Man	nufa	ctu	ring	Trade	e P	er Lb.
ight ring	wir			**				2.30c. 2.90c. to the
snufac	fur	ing	tre	ide	are	\$1 0	lon	above

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

Constitution of the
Smooth coated nails 2.60 Galvanized nails:
15 gage and engrser 4.60
If gage and finer 5.10
Base per 100 Lb.
Annealed fence wire\$2.45
Galvanized fence wire 2.80
Polished staples 3.30
Galvanized staples 3.55
Barbed wire, galvanized 3.00
Barbed wire, galvanized 3.00 Woven wire fence, base column 63.00

Woven wire fence, base column...... 63.08
Chicago and Anderson, Ind., mill prices
are \$1\$ to never Pittsburgh base (on all
products except weven wire fence, for which
the Chicago price is \$2\$ above Pittsburgh;
Duluth, Minn., and Worcester, Mass., mill
prices are \$2\$ a lon over Pittsburgh (exevent for woven wire fence at Duluth which
is \$2\$ over Pittsburgh, and \$2\$ minninghm
mill prices are \$3\$ a ton over Pittsburgh.
On wire noils, band wire states.

mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbod wire, steplee and fence wire, prices at Houston, Gulvesten and Corpus Christi, Tes., New Orleans, Lake Charles, La., and Mobile, Ale., are \$3 a ton over Pittsburgh, while Pacific Coast prices are \$3 over Pittsburgh. Exception: on fence wire Pacific Unst prices are \$31 a ton above Pittsburgh.

On staples and barbod wire, prices of \$5 a ton above Pittsburgh are along wired at Beaumont and Orange, Tes.

Wire	Hoops,	Twisted or Weld	bs
F.o.b. F.o.b.	Pittsburgh Chicago	35 and 2½	ist off off

STEEL AND WROUGHT PIPE AND TUBING Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohie, Mills

F.o.b. Pittsburgh only on wrought iron Butt Weld

Steel		Wrought Iron
Inches Black	Galv.	Inches Black Galv.
% to % 53 %	35	% & % +1%+21%
%62	52	36% 20%
1 to 364	55	141% 39% 25%
		241% 26

Lap Weld

2 % to 3.63 3% to 6.65 7 and 8.64 9 and 10.63% 11 and 12.62%	51 54 56 54 531/4	2 37 2½ to 3½ 38 4 to 8 40 9 to 1238	22 1/4 25 28 1/4 24 1/3
11 and 1262%	521/2		

Butt Weld, extra strong, plain ends

1/4 to 1/4	481/4	331/2	1200	+244	45%
% to %	561/6	47%	2	32 1/4	171
1 to 3	63	55	1 to	343%	29

Lap Weld, extra strong, plain ends

258 2½ to 362 3½ to 665½ 7 and 864½ 9 and 1063½ 11 and 12.62½	50 54 5714 5416	21/4 to 4 41/4 to 6 7 & 8	40 451/2 43 46	26 33 331/4 33
9 and 10631/2 11 and 12.621/2	531/2 521/2	9 to 12.	41%	30

On standard steel pipe an extra 5% On standard steel pipe an extra 5% off is allowed on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to cumsumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the bill-

ing being from the point producing the lowest price to destination.

(Net base prices per 100 ft. f.o.b. Pius,

Boiler Tubes Seamless Steel Commercial Boiler Tubes

frace name h	n acces	from con	load lot	CO.O. EN	
Du	irgu,	III CHI	Cole	a)	
			Decem	n Roll	٠.
	10 D	W 0	Draw	tr mon	86
1 in. o.d.	13 13	W.G.	\$ 8.60	#1.	
1% in. o.d.	13 B	W.G.	10.18	9.3	Ħ
1% in o.d. 1% in. o.d.	13 B	W.G.	11.26	10,	
1 % in. o.d.	13 B	. W.G.	12.81	11.	
2 in. o.d.	13 B	.W.G.	14.30	13.	
214 in. o.d.	13 B	.W.G.	16.00	11. 10. 11. 13. 14. 17.	
2% in. o.d. 2% in. o.d.	12 B	.W.G.	19.29	17.	54
2% in. o.d.	13 B	.W.G.	20.45	18.	20
3 in. o.d. 3 in. o.d. 3 in. o.d.	12 B	.W.G.	21.40	19,	50
3% in. o.d.	11 B	.W.G.	25.22	22,1	
3½ in. o.d. 4 in. o.d.	11 B	.W.G.	27.09	24.	
4 in. o.d.	10 R	.W.G.	33.60	30.1	
41/2 in. o.d.	10 B	.W.G.	41.08	31.	額
5 in. o.d.	9 B	.W.G.	51.56	46.	
4½ in. o.d. 5 in. o.d. d in. o.d.	7 B	.W.G.	79.15	71.5	16
Extras 1	or le	ss-carl	oad qua	ntities:	
25,000 lb. or 10,000 lb. or	r ft. 1	e 39,9	99 lb. o	r ft. 5	%
10,000 lb. or	r ft. i	to 24,9	199 lb. o	r ft. 12%	5
2,000 lb. or	TL. I	0 9,9	99 lb. o	r ft. 25	5
Under 2,000	Ib. (or ft.		40	%
Hot-Finished	I Lan	mold 5	Heal Bre	soure Pul	-
(Net base p	rices	per 1	00 ft.	f.o.b. Pun	
(Net base p	rices urgh.	per 1 in car	00 ft.,	f.o.b. Pin	-
(Net base p	rices irgh,	per 1 in car 3. W.G	00 ft., load lots	f.o.b. Pun	12
(Net base p bi 1½ ino.d 1% in. o.d.	rices irgh, 1 13 H	per 1 in car 3. W.G 3. W.G	00 ft., load lots	f.o.b. Pin	12 06
(Net base p bt 1½ me.d 1% in. o.d. 2 in. o.d.	rices irgh, 1 13 H 13 H	per 1 in car 3.W.G 3.W.G	00 ft., load lots	f.o.b. Pin	12 00 20
(Net base p b) 1½ in. o.d. 1% in. o.d. 2 in. o.d.	rices irgh, 1 13 I 13 I 13 I	per 1 in car 3.W.G 3.W.G 3.W.G	00 ft., load lots	f.o.b. Pin	120030
(Net base p b) 1½ in. o.d. 1% in. o.d. 2 in. o.d.	rices irgh, 1 13 I 13 I 13 I	per 1 in car 3.W.G 3.W.G 3.W.G	00 ft., load lots	f.o.b. Pin	12 00 00 77
(Net base p bu 1½ in. o.d. 1% in. o.d. 2¼ in. o.d. 2¼ in. o.d. 2½ in. o.d. 2% in. o.d.	rices irgh, 1 13 I 13 I 13 I 13 I 12 I 12 I	per 1 in car 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G	00 ft., load lots	f.o.b. Pin 1) \$ 9. 11. 12. 18. 16.	T2 06 30 71 54 54
(Net base p bu 1½ in. o.d. 1¼ in. o.d. 2¼ in. o.d. 2¼ in. o.d. 2½ in. o.d. 2½ in. o.d. 3¼ in. o.d. 3 in. o.d.	rices irgh, 1 13 H 13 H 13 H 13 H 12 H 12 H	per 1 in car 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G	00 ft., load lots	f.o.b. Pint 1) \$ 9. 11, 12. 18, 16, 17, 18,	72 06 30 TI MI 54 86
(Net base p bt 1½ in. o.d. 1¾ in. o.d. 2¼ in. o.d. 2¼ in. o.d. 2¼ in. o.d. 3¼ in. o.d. 3¼ in. o.d. 3¼ in. o.d. 3¼ in. o.d.	rices 13 H 13 H 13 H 13 H 12 H 12 H 12 H	per 1 in car 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G	00 ft., load lots	7.o.b. Pin 1) \$ 9. 11, 12. 18. 16. 17.	T 12 00 20 77 54 55 55
(Net base p but 1½ ino.d. 1½ in. o.d. 2 in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3¼ in. o.d. 3¼ in. o.d. 3¼ in. o.d. 3¼ in. o.d.	rices irgh, 1 13 H 13 H 13 H 12 H 12 H 12 H 11 H	per 1 in car 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G	00 ft., load lots	(.o.b. Pin 1) \$ 0, 11, 12, 16, 17, 18,	72 06 28 77 MA SA
(Net base p by 1½ in. o.d. 2 in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3½ in. o.d. 3½ in. o.d. 4½ in. o.d. 4½ in. o.d.	rices irgh, 1 13 H 13 H 13 H 12 H 12 H 12 H 11 H	per 1 in car 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G	load lots	(.o.b. Pin (.) \$ 9; 11, 12, 13, 16, 17, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18	T2 00 20 77 M 54 20 50 11 00
(Net base p but 1½ in. o.d. 1% in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3½ in. o.d. 3½ in. o.d. 4½ in. o.d. 4¼ in. o.d.	rices argh, 1 13 H 13 H 13 H 12 H 12 H 12 H 11 H 10 H	per 1 in car 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G	00 ft., load lots	(.o.b. Pin) \$ 9; 	72 00 30 71 MA 54 35 5M 11 66 11
(Net base p 1½ in. o.d. 1½ in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3½ in. o.d. 3½ in. o.d. 4½ in. o.d.	rices 1 13 1 13 1 13 1 13 1 13 1 12 1 12 1 11 1 10 1 10 1	per 1 in car in car 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G	00 ft., load lots	(.o.b. Pin) \$ 9; 	72 00 30 71 MA 54 35 5M 11 66 11
(Net base p 1½ in. o.d. 1½ in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3½ in. o.d. 3½ in. o.d. 4½ in. o.d.	rices 1 13 1 13 1 13 1 13 1 13 1 12 1 12 1 11 1 10 1 10 1	per 1 in car in car 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G	00 ft., load lots	(.o.b. Pin) \$ 9; 	72 00 30 71 MA 54 35 5M 11 66 11
(Net base p but 1½ in. o.d. 2 in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3¼ in. o.d. 3¼ in. o.d. 4½ in. o.d. 4 in. o.d. 4½ in. o.d. 5 in. o.d. 6 in. o.d.	rices 1 13 1 1 13 1 1 13 1 1 13 1 1 12 1 1 12 1 1 1 1 1 1 1 1 1 1 1 0 1 1 0 1 1 0 1 1 0 1	per 1: in car 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G 3. W.G	oo ftload lots	(.o.b. Pin (.o.b.	72 00 30 71 MA 54 35 5M 11 66 11
(Net base p bd. 1 1/2 in. o.d. 2 in. o.d. 2 1/4 in. o.d. 2 1/4 in. o.d. 2 1/4 in. o.d. 3 1/4 in. o.d. 3 1/4 in. o.d. 3 1/4 in. o.d. 4 1/4 in.	rices irgh, 1 13 1 13 1 13 1 13 1 12 1 12 1 12 1 11 1 10 1 10 1 9 1 7 1 Quair ft.	per 1: in car 3. W.G 3. W.G	00 ft., load lots	(.o.b. Pin (.o.b.	72 00 30 71 MA 54 35 5M 11 66 11
(Net base p 1½ fno.d. 1½ in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3½ in. o.d. 3½ in. o.d. 4½ in. o.d. 45 in. o.d. 45 in. o.d. 40,000 ib. o.d.	rices irgh, 1 13 1 13 1 13 1 13 1 12 1 12 1 12 1 11 1 10 1 10 1 Qual r ft.	per 1: in car 3. W.G 3. W.G	00 ft., load lots	f.o.b. Pini \$ 9; 11, 12, 16, 17, 18, 28, 28, 44, 48,	72 06 38 71 M 54 86 51 25 14
(Net base p bd. 1 1/2 in. o.d. 1 1/4 in. o.d. 2 1/2 in. o.d. 2 1/4 in. o.d. 2 1/4 in. o.d. 3 1/4 in. o.d. 3 1/4 in. o.d. 3 1/4 in. o.d. 4 1/6 in. o.d. 5 1/6 in. o.d. 4 1/6 in. o.d. 6 1/6	rices irgh, 1 13 1 13 1 13 1 12 1 12 1 12 1 11 1 10 1 10 1 Qual r ft.	per 1: in car 3. W.G 3. W.G	00 ft., load lots	f.o.b. Pini) \$ 9. 11. 12. 13. 16. 17. 16. 21. 22. 23. 24. 24. 25. 26. 27. 28. 28. 28. 28. 28. 28. 28. 28	72 06 38 71 M 54 86 51 25 14
(Net base p 1½ fmo.d 1½ in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3½ in. o.d. 3½ in. o.d. 4½ in. o.d. 4½ in. o.d. 45 in. o.d. 6 in. o.d. 6 in. o.d. 40,000 ib. oor ft	rices 13 13 13 13 14 15 15 16 17 17 17 17 17 17 17	per 1 in car 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G	00 ft., load lots Extras: .999 lb.,	f.o.b. Pini \$ 9. 11. 12. 13. 16. 17. 18. 21. 21. 22. 23. 24. 44. 48.	72 06 30 71 M 54 35 5H 11 25 14 5
(Net base p 1½ in. o.d. 1½ in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3½ in. o.d. 3½ in. o.d. 4½ in. o.d. 4½ in. o.d. 4½ in. o.d. 40000 ib. o 25,000 ib. o or ft	rices irgh, 13 H 13 H 13 H 13 H 12 H 12 H 11 H 11 H	per 1: in car 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G	00 ft., load lots Extras: 999 lb.,	f.o.b. Pini) \$ 9.	72 06 30 71 M 54 35 5H 11 25 14 5
(Net base p 1½ in	rices	per 1 in car 3. W.G 4. W.G 3. W.G 4. W.G 5. W.G 6.	00 ft., load lots Sxtras:	f.o.b. Pini \$ 9. \$ 11, 12. 13. 16. 16. 17. 18. 28. 28. 44. 48. base	72 06 30 71 M 54 35 5H 11 25 14 5
(Net base p 1½ in. o.d. 1½ in. o.d. 2½ in. o.d. 2½ in. o.d. 2½ in. o.d. 3½ in. o.d. 3½ in. o.d. 3½ in. o.d. 4½ in. o.d. 4½ in. o.d. 4½ in. o.d. 40000 ib. o 25,000 ib. o or ft	rices argh, 1 13 1 13 1 13 1 13 1 12 1 12 1 12 1 1	per 1 in car 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 3.W.G 4.W.G 4.C.C 4.C.C 5.C.C 5.C.C 6.C.C	00 ft., load lots Extras: 999 lb., 999 lb.	(o.b. Pini) \$ 9. \$ 11. 12. 13. 16. 17. 18. 28. 28. 35. 44. 48. base plus 12% plus 25	T 12 00 00 71 10 10 10 10 10 10 10 10 10 10 10 10 10

CHARCOAL IRON BOILER TUBES

Danc	1710	cou	BILL	Dp.	T.t	-Uo	R. HPFW	ourga
In. O.	D.							
11/2 and	1 17						4	4
2 -24							1	3 and 1
21/2-29							10	8 and 1
3							1	7 and 1
314-31	6						11	8 and 1
4							2	0 and 1
41/2, 5,	6						2	1 and 1
Evtra	a fo	. 0	1107	411		For	114	to 19
up 8 pe								
10,000	lb.	in e	arl	onc	i.	For	2 in.	to 5
in., up	0 0	det	1 19	401	Anni	8111	nleme	miase I
per cen	a pr	MILL	. W	LUI	lou	i aug	hieme	tienty /
5 per								
per cent	TOP .	1.00		1 11	D 1	o ca	rioso.	

per cent for 10,000 lb. to carload.
In sizes 2 in. to 4½ in. O.D. inclusive,
all tubes more than four grages bessies
than standard are priced per 1b. as fellows: Carload and over, 9c.; extras for
quantity—under 10,000 lb. 1c. per lb.,
10,000 lb. to carload ½c. per lb.

CAST IRON WATER PIPE

					Per	No	et T
*6-in.	and	larger.	del'd	Chie	ago		\$47.
*4-in.	. del'	d Chie	ago .				50.
6-in.	and	larger.	del'd	New	York	£	45.
4-in.	del'd	New Y	ork				48.
6-in.	and	larger,	Birn	ningh	ım		. 39.
4-in.	Birm	ingham					42.

Class "A" and gas pipe. \$3 extra
"Prices for lots of less than 200 less.
For 200 tons and over, 6-in, and larger li
\$46 and 4-in, pipe \$40 a ton, delivered
Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

THEFT	EWITTE	(TIONS	I MAE	Brei	283	there
gross	ton.					
			R	220	-	100
Spikes, Spikes, Spikes, Tie pla Tie pla	9/16	in. and	larg	er		1
Spikes,	36 11	a. and	small	er .		
Spikes,	boat	and be	rge .			
Tie pla	tes, #	teel				
Tie pla	tes, P	acific !	Coast	port	8	
Track b						
Track b	olts, 1	oddot or	rs. al	l siz	tes 6	per
100 c	ount)		7	0 pe	F CE	nt off

Basing points en light rails are Piti-burgh. Chicago and Birmingham; en spikes and tie plates, Pittsburgh, Chicago Buffalo, Portsmouth, Ohlo, Weirton, W. Va., St. Louis, Kanasa City, Minneuga. Colo., Birmingham and Pacific Coas-ports; on tie plates alone, Steelton, Pa., on spikes alone, Cleveland, Youngstome, Lebanon, Pa., Columbia, Pa., Richmond. Va., Jersey City, N. J.

48-The Iron Age, December 27, 1934

BOLTS, P (F.a.b. Pit

Machine bo Carriage bo Lag bolts. Lag bolts. Plow bolts, heads. See Pressed square ... Res-pressed hexaguita C.p.c. and blank or Semi-dinishe all sizes comi-dinishe lag in to larger thi Rice bolts. Blove bolts. Store bolts. Store bolts.

F.o.b. Pitt F.o.b. Clev F.o.b. Chier Ca (Preight al Me. per 100 Milled cap smaller filled stan-ened, 1 Milled head % in. a Upset hex. er S.A.E smaller Upset set Milled stud

Alloy S T F.o.b. I Massillon, Name price

Alloy a

Price del P.o.b. I Schlehem, Open-hearth Delivered p S.A.E.

Rumbers

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(Base

BOLTS, NUTS, RIVETS AND SET SCREWS

	Bolts a	ind Nuts	
(F.e.b.	Pittsburgh, ham or	Cleveland, Chicago)	Birming
		Per C	ent Of Li
Wachine	bolts		
	bolts		
far bol	ts		0, 10 and 1
Plaw b	olts, Nos.	1, 2, 3	and 7
beads			0. 10 and 1
Hat-pre	sed nuts, l	plank or	tapped.
SHUBER			0. 10 and 1
Hat-pres	sed nuts,	blank or t	tapped.
besno	BEN	7	0, 10 and 1
Ca.c.	and t. squar	re or hex.	nuts.
blank	or tapped .		0. 10 and 1
Sami-fin	ished bexag	on nuts.	U.S.S.
all of	zes		0. 10 and 1
Semi-fir	ished hexag	on nuts.	8.A.E.
W In.	to 7/16 in.	diameter. 7!	5. 10 and 1
	. to 1 in. d		
larger	than 1 in.	diameter 7	5. 10 and 1
Steen b	olts ii pack	ages. Pitts	hurgh T
Store b	olts in pack	ages. Chica	100 7
Store by	olts in packs	ges. Clevel	and 7
Store h	olts in bulk.	P'rh	8
Steen h	olts in bulk,	Chicago.	
Store he	olts in bulk,	Claveland	
Sine hal	ta	Caeverand.	60 and 1
Ind int		Rivets	oo anu A
	(721-11). 8	ind larger)	400 FI
m . t . 1	ittsburgh or	Charaland	per 100 L
		Lieveland.	

b. Pitte

..\$ 9.72 ... 11.06 ... 12.38 ... 13.79 ... 16.58 ... 17.54 ... 18.35 ... 23.15 ... 23.15 ... 23.15 ... 25.01 ... 25.01 ... 25.01 ... 25.01

s 12%%

TUBES

4 3 and 10 6 and 10 7 and 10 8 and 10 0 and 10 1 and 10 to 1%, 4 points, to 5% miary 10 ementary 10

IPE

Net Ton . \$47.00 . 50.00 . 45.00 . 48.00 . 39.00 . 42.00

ALS

\$36,37% 2.55 ata 2.55 ata 2.55 ata 2.55 ata 2.55 ata 2.50 ata 2.50

15

Ruse per 100 Lb.
F.e.b. Pittsburgh or Cleveland \$2.90
F.o.b. Chicago 3.00
F.a.b. Hirmingham 3.05
Small Rivets
(7/16-in, and smaller)
Per Cent Off List
F.o.b. Pittsburgh
F.a.b. Cleveland
F.o.b. Chicago and Birm'g'm 70 and 5
Cap and Set Screws
(Freight allowed up to but not exceeding
He per 100 lb. on lots of 200 lb. or more) Per Cent Off List
Milled cap screws, 1 in. dia. and
smaller

Milled	standard set screws, case hard-	
ened	1 in. dia. and smaller	
Willed	headless set screws, cut thread	
86 1	n. and smaller	
Donal	hex. head cap serews, U.S.S.S.	
filmer c	A.E. thread, 1 in. dia. and	
- m-2	lee	1
BEST	ler	ij
Upaes	set screws, cut and oval point	
	75 and 10 to	
Milled	atuds	1

Alloy and Stainless Steel
Alloy Steel Ingots
F.o.b. Pittsburgh, Chicago, Canton. Massillon, Buffalo, Bethlehem. Caropped
Uncropped\$40 per gross ton
Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massilion, Buffalo, Bethlehem. Hase price, \$49 a gruss ton. Alloy Steel Bars
Price del'd Detroit is \$52. F.o.b. Pittsburgh, Chicago, Buffalo,
Bethlehem, Massillon or Canton.
Open-hearth grade, base2.45c. Dallwered price at Detroit is2.60c. S.A.E. Alloy
feries Differential
Warmlann - 100 15
Numbers per 100 lb. 180 (3½% Nickel)
1166 (2½% Nickel) 0.55 1300 (3½% Nickel) 1.50
800 (5% Nickel) 2.25
1100 Nickel Chromium 0.55
100 Nickel Cheamium 2 90
MOU NICKEI Chromium 3.29
tive Chromium Molybdenum (0.15
to 0.25 Molybdenum) 0.50
to 0.40 Molybdenum) 0.70
4800 Nickel Molybdenum (0.20 to .
0.30 Molybdenum) (1.50 to
2.00 Nickel) 1.05
6100 Chromium Steel (0.60 to 0.90 Chromium) 0.35
0.90 Chromium) 0.35
1.10 Chromium) 0.45
1100 Chromium Spring Steel base
100 Chromium Vanadium Bar 1.20 100 Chromium Vanadium Spring
Steel 0.70
Steel 0.70 Caremium Nickel Vanadium 1.50 Carbon Vanadium 0.95
Carbon Vanadium 0.95
ters. The differential for most grades in electric furnace steel is 50c, higher. The
differential for cold-drawn hars in We ner
differential for cold-drawn hars is %c. per h higher with separate extras. Blooms,
afflets and slabs under 4x4 in. or equiv- that are sold on the bar base. Elabs with a section area of 16 in. and 244 in. thick
that are sold on the bar base. Blabs with
Fores take the billet bess Sections and
to 10x10 in. or equivalent carry a
area ion price, which is the net price for
tars for the same analysis. Larger sines
entry extras.

CELL		tras.						
	A	lloy	Cole	d-Fin	ishe	i Ba	ITS	
. F.	.e.b.	Pitti	burg	h. Chi	lcago,	Gar	y, Cle	re-
land	or	Buff	alo,	2.95c.	trane	per	lb.	
	ST	AIN	LESS	STE	EEL	No.	302	
(17	to	19%	Cr.	7 to	9%	N1.	0.08	te
			0.	20%	C)			

(Hase	Price	8,	- 1	1.0	0.8		P	utt	8b	ur	g)	h)	
_												Per	Lb
Forging b	llets											19	.55c
Merolling	labs												15c.
DACS													23c.
Plates					* *								26c.
Structural	shape		*							**			23c
Sheets		**				**					*		33C,
out-relled	strip											.20	M.C.
Cold-rolled	strip											**	Z7c.
Brawn wire			è										23c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots
F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Uncropped
Carbon Steel Forging Ingots
F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham. Uncropped\$31 per gross ton

Billets, Blooms and Slabs
F.o.b. Pittsburgh, Chicago, Gary, Cleve- land, Youngstown, Buffalo, Birmingham.
Rerolling
Forging quality 32.00
Delivered Detroit
Rerolling\$30.00
Forging Billets Only F.a.b. Duluth
Rerolling

F.o.b. Pittsburgh, Youngstown, Buffalo, Point, Md.		Cleveland, Sparrows
Point, Mu.	Pe	Grass Ton

					2	31	k	•	1	p	ķ							
F.o.b. Buffalo, Md.																	Po	in
Grooved		-														*		70
Universal Sheared																	1.	

	Tube Rounds
F.o.b. F.o.b.	Bass per Lb. Pittaburgh 1.80c. Chicago 1.85c. Cleveland 1.85c. Buffalo 1.90c. Birmingham 1.95c.
	Wire Rods

	(Common, base) Fer Grass T	01
F.o.b.	Pittsburgh\$38.0	K
	Cleveland 38.0	
F.o.b.	Chicago 39.0	H
F.o.b.	Anderson, Ind 39.0	H
F.o.b.	Youngstown 39.	N
F.o.b.	Worcester, Mass 40.	×
F.o.b.	Birmingham 41.	Ņ
F.o.b.	San Francisco 47.0	N
F.o.b.	Galveston 44.	9(

Pig Iron and Ferroalloys

PRICES PER GROSS TON AT BASING POINTS

	No. 2 Fdry.	Malleabio	Basic	Bessemer
Everett, Mass	\$19.50	\$20.00	\$19.00	\$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa	19.50	20.00	19.00	20.50
Swedeland, Pa	19.50	20.00	19.00	20.50
Steelton, Pa.			19.00	*****
Sparrows Point, Md	19.50	*****	19.00	*****
Neville Island, Pa	18.50	18.50	18.00	19.00
Sharpsville, Pa	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Ruffalo	18.50	19.00	17.50	19.50
Erie, Pa	18.50	19.00	18.00	19.50
Cleveland	18 50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20 25	20, 25	19.75	*****
Detroit	18.56	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.60
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill	18 50	18.50	18.00	
Duluth, Minn	19.00	19.00		19.50
	14.50	14.50	13.50	19.00
Provo. Utah	17.50	11.00	17.00	10.00

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
From Everett, Mass	\$20.00	\$20.50	\$19.50	\$21.00
From East Pa. or Buffalo	21.77	22.27	21.27	22,77
Newark or Jersey City, N. J. From East. Pa. or Buffalo	20.80	21.39	20.39	21.89
Philadelphia From Eastern Pa	20.26	20.76	19.76	21.26
From Hamilton, Ohio	19.51	19.51	19.01	20,61
From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio From Hamilton, Ohio	20.50	20.50	*****	****
Mansfield, Ohio From Cleveland and Toledo	20.26	20.26	****	
Indianapolis Frore Hamilton, Ohio	20.77	20.77	****	*****
Scuth Bend, Ind. From Chicago	20.55	20.55		****
Milwaukee From Chicago	19.50	19.50	*****	
St. Paul From Duluth	20.94	****	****	****
From Chicago	20.26	20.26		*****
From Granite City	21.04	21.04		****
-				

Delivered prices on Southern from for shipment to Northern points are 35s, a gross ton below delivered prices from the nearest Northern hasing points.

LOW PHOSPHORUS PIG IRON

Basing	poi	nts:	Bir	da	bai	ro	4	F	'n	01		g	8	81	el	
ton,	Pa.	ami	1 8	tar	ıdi	s	h,		N		1	ľ				\$23.50
John	son	City	, 1	l'en	n.				×	9.1						23,50
Del'	l CI	hicag	00											*		29.15

	GRA								
Valle Pittel	y furn	dis	trict	fur	nac	30	* 1	 	 18.0
			CO						
Lake	Supe	rior Chi-	furi	nace				 	 \$21.0

CANADA

Per	gross	ton:	Pig	tro	m		
		Del	ivered	T	erent		
No.	1 fdy., 2 fdy., leable	sil.	1.75	10	2.75		 20.50
		Deli	vered	М	ntre	al	
No. Mall	1 fdy., 2 fdy. leable	. sil.	1.75	10	2.25.		 22.00 22.50

FERROALLOYS

_		
F.o.b. New more, Mobile		Balti-
Domestie, 809	(earload)	088 Ton .\$15.09

			Per	Grane Tor	Furnace
Domestic.	19	to	31%	*******	\$26.00

Electric Ferrosilicon

		Iross Ton De	
50%	(carloads)		.\$77.50
	(ton lots)		85.00
	(carloads)	*******	126.00
75%	(ton luts) We	*********	136.60
14%			'
	(in carloads) (duty		31.00
14%	to 16% (less carlos	ds)	38,50

Silvery Iron

F.o.b. Jackson, Ohio, Furnass

	Per Gross 1	Ton :	1	Per	Gros	a Ton
6%		.75				29.25
7 % 8 %	23.	.75	13% .			30.75
846	24	.75	14% .			32, 25
9.05	25	.75	15%			33.75
10%	26	.75	16%			35.25
11%	27	.75	17%			36.71
Th	e luwer all		delivere	d p	rice	from
Jacks	on or Buffs	lo is	quoted	wit	h fr	eight
allow	ed. Base p	orices	at Buff	alo	are	\$1.25
	S. S. Share After					-

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

	Per Grass Ton	1	Per Gu	as Ton
10%	\$27.75	14%		
11%	28.75	15%	******	34.75
12%	30.25	17%		36.25
13%	31.75	11.70		

Manganese 1% to 3%, \$1 a ton additional. For each unit of manganese seas 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys
Ferrotungsten, per lb. contained W, del., carbads
Ferrochromium, 4 to #% carbon and up, 65 to 79% Cr. per II. contained Cr. delivered, in car- loads
Ferrochromium, 2% carbon
Ferrochromium, 1% carbon
Perrochromium, 0.10% carbon
Ferrochromium, 0.06% carbon
Perrovanadium, del., per lb. contained V\$2.70 to \$3.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton \$137.50
Ferrophosphorus, electric, er blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with \$2 unitage 50.09
Ferrophospherus, electric, 24% f.o.b. Anniston, Ala., per gress ton with \$2.75 unitage
Perromolybdenum, per lb. Ma., del. 95c.
Calcium molybdate, per lb. Mo., del 80e.
Silice spiegel, per tan, f.o.b. fur- nace, car lots
Silico-manganese, gruss ton, deliv-
ered: 2.50% carbon grade 98.08 2% carbon grade 95.00 1% carbon grade 105.00

Iron and Steel Scrap

Per gross ton delivered consumers'	yards:				
No. 1 heavy melting steel.\$13.00 t	£13.50				
No. 2 heavy melting steel. 11.50 t					
No. 2 railroad wrought 13.00 t					
Scrap rails 13.00 t					
Rails 3 ft. and under 14.50 t	0 15.00				
Compressed short steel 12.75 t					
Hand bundled sheet steel 11.50 t					
	n 10.50				
	0 9.50				
Short show, turnings 9.00 t					
Short mixed burings and					
turnings 5.25	to 5.75				
Cast iron borings 5.25	0 5.75				
Cast iron carwheels 12.00 t	0 12.50				
Heavy breakable cast 11.50 t					
No. 1 cast 12.50 t	0 13.00				
Railr. knuckles and cou-					
plers 15.50 t	0 16.00				
Rail, coil and leaf springs 15.50 t	0 16.00				
Rolled steel wheels 15.50 t	0 16.00				
Low phos. billet crops 15.00 t					
Low phos, sheet bar crops, 15.00 t	n 15.50				
Low phos. plate scrap 13.50 t	0 14.00				
Law phos. punchings 14.00 t					
Steel car axles 14.00 t	0 14.50				

CHICAGO

Delivered Chicago district consumers:

Per tirum Ton		
Heavy melting steel\$	10.50 to	\$11.00
Automobile hvy. melt, steel	8.75 to	9.25
Shoveling steel	10.50 to	11.00
Hydraulic comp. sheets	9.75 to	10.25
Drop forge flashings	8.75 to	9.25
No. 1 busheling	9.50 to	10.00
	12.00 to	12.50
Railroad tires	12.00 to	12.50
	12,00 to	12.50
Axle turnings	10.00 to	10.50
Steel couplers and knuckles	12.00 to	12.50
	12.50 to	13.00
	10.00 to	10.50
	12.50 to	13.00
Low phos. plates, 12 in.		
	12.50 to	13.00
Cast iron borings	6.25 to	6.75
Short shoveling turnings	6.25 to	6.75
Machine shop turnings	5.50 to	0.00
	11.00 to	11.50
	12.00 to	12.50
	13,00 to	13.50
	11.50 to	12.00
Cast iron carwheels	11.50 to	12.00
Ratiroad malleable	11.50 to	12.00
Agricultural malleable	9.50 to	10.00

Iron car axles	15.00	to	\$15.50
Steel car axles	15.00	to	15.50
No. 1 railroad wrought	9.75		10.25
No. 2 railroad wrought	9.59		10.00
No. 2 busheling	5.25		5.75
Locomotive tires, smooth	10.00		10.50
Pipe and flues	5.00	to	5.50
No. 1 machinery cast	10.00	to	10.50
Clean automobile cast	10.00	to	10.50
No. 1 railroad cast	8.75	to	9.25
No. I agricultural cast	8.50		9.00
Store plate	5.75	100	6.25
Grate bars	5.75	Esp	6.25
Brake shoes	6.50	to	7.00

PHILADELPHIA

Per gross ton delivered con	sumers'	yards:
No. 1 heavy melting steel.	10.50 to	\$11.00
No. 2 heavy melting steel.	9.00 to	9.50
No. 1 railroad wrought	11.00 to	11.50
Bundled sheets	****	9.00
Hydraulic compressed, new	10.00 to	10.50
Hydraulic compressed, old.	6.50 to	7.00
Machine shop turnings	5.50 to	6.00
Heavy axle turnings	8.50 to	9.00
Cast borings	5.00 to	5.50
Heavy breakable east	10.00 to	10.25
Stove plate (steel works)	8.50 to	
No. 1 low phos. heavy	15.00 to	9.00
Couplers and knuckles	14.00 to	14.50
Rolled steel wheels		
No 1 bleet frames	14.00 to	14.50
No. 1 blast furnace	5.00 to	5.50
Spec, iron and steel pipe	****	8.00
Shafting	16.50 to	17.00
Steel axles	16.50 to	17.00
No. 1 forge fire	70.00 10	9.00
Cast from our mhoole	77 70 4-	
Cast fron car wheels	03 06.11	12.00
No. 1 cast	10.50 to	11.50
Cast borings (chem.)	12.00 to	14.00
Steel rails for rolling	****	12.00

CINCINNATI

mounts multiple bereiber fiebes foll!		
Heavy melting steel \$8.25 to	\$8.75	
Scrap rails for melting 9.50 to	10.00	
Loose sheet clippings 5.00 to	5.50	
Bundled sheets 7.00 to	7.50	
Cast fron borings 5.50 to	6.00	
Machine shop turnings 5.50 to	6.00	
No. 1 busheling 7.00 to	7.50	
No. 2 busheling 3 75 to	4.25	
Rails for rolling 10 00 to	10.50	
No. I locomotive tires 9.50 to	10.00	
Short rails 12.50 to	13.00	
Cast iron carwheels 9.00 to	9.50	
No. 1 machinery cast 10.25 to	10.75	
No. 1 railroad cast 9.50 to	10.00	
Burnt cast 7.00 to	7.50	
Stove plate 7.00 to		
Agricultural malleable 9.00 to	9.50	
Railroad mallachia 0 95 to	0.78	

Per gross ton delivered consumers'	yards:
No. 1 heavy melting steel.\$10.00 to	\$10.50
No. 2 heavy melting steel. 9.50 to	10.00
Compressed sheet steel 10.00 to	10.50
Light bundled sheet stamp-	
ings 7.50 to	8.00
Drop forge flashings 9.00 to	
Machine shop turnings 6.50 to	7.00
Short shoveling turnings., 7.00 to	
No. 1 busheling 9.00 ti	
Steel axie turnings 9.00 to	
Low phos. billet crops 14.00 to	
Cast iron borings 7.00 to	
Mixed borings and short	
turnings 7.00 to	7.50
No. 2 busheling 7.00 to	
No. 1 cust 11.50 to	
Railroad grate bars 7.00 to	7.50
Store plate 7.25 to	7.50
Rails under 3 ft 14.50 to	
Rails for rolling 15.50 to	18.00
Railroad malleable 11.50 to	
Cast iron carwheels to	

BUFFALO

Per gross ton, f.o.b. Buffalo consumers'

plants:			
No. 1 heavy melting steel .:	\$10.50	bo	\$11.0
No. 2 heavy melting scrap.			
Scrap rails	10.50	to	11.0
New hydraul, comp. sheets	9.50	to	10.00
Old hydraul. comp. sheets	8.25	to	8.7
Drop forge flashings	9.50	to	10.0
No. 1 busheling	9.50	to	10.0
Hvy, steel axle turnings	7.00		
Machine shop turnings	5.00	to	5.50
Knuckles and couplers			13.00
Coil and leaf springs	12.50	10	13.00
Rolled steel wheels	12.50	to	13.0
Low phos. billet crops	12,25	to	12.7
Short shov, steel turnings.	5.50		6.0
Short mixed borings and			
turnings	5.50	to	
Cast iron borings	5.50	to	6.00
No. 2 busheling	6.00	to	6.50
Steel car axles	11.00	to	
Iron axles	11.00	to	11.50
No. 1 machinery cast	11.50	to	12,00
No. 1 cupola cast	9.50	to	10.00
Stove plate	9.25		
Steel rails, 3 ft. and under	12.50		
Cast fron carwheels	10.50		11.00
Industrial malleable	12.00	to	12.50
Railroad malleable	12.00	to	12.5
Chemical borings	7.00	to	7.50
The state of the s			

BOSTON

0001011		
Dealers' buying prices per	gross to	n:
*No. 1 heavy melting steel.	\$8.25 to	\$8.56
No. 1 heavy melting steel.	7.00 to	7.25
Scrap T rails	7.00 to	7.25
*No. 2 steel	7.25 to	7.50
No. 2 steel	6.00 to	6.25
Breakable out	6.00 to	
Machine shop turnings		2.75
Bundled skeleton, long	5.50 to	5.75
Forge flashings	5.50 to	5.75
Shafting	11.50 to	12.00
Steel car axles	11.50 to	12.00
Cast iron borings, chemical	6.50 to	7.00
Store plate		4.25
Per gress ton delivered con	sumers'	yards:
Textile cast		\$9.50
No. 1 machinery cast	9.00 to	9.50
Stove plate	6.00 to	6.50
Railroad malleable		11.50

^{*} Delivered local army base.

NEW YORK

Dealers' buying prices per gross	ten:
No. 1 heavy melting steel. \$7.00	†8.50
No. 2 heavy melting steel. *5.50 t	to †7.00
Heavy breakable cast 6.25	
No. 1 machinery cast 7.25	
No. 2 cast 6.50	
Stove plate 5.75	
Steel war axles 12.50	
No. 1 railroad wrought 7.50 (No. 1 yard wrought, long. 6.50 (
Spec, iron and steel pipe. 4.50	
Forge fire 5.50	
Forge fire 5.50 Rails for rolling 9.00	
Chart shareling tuenings 9 50	
Short shoveling turnings 2.50	
Machine shop turnings 2.50	
Cast borings 3.50	
No. 1 blast furnace 2.00 i	
Cast borings (chemical) 11.00 i	tn 11.50
steel 4.00	to 4.50
Per gress ton, delivered lecal foun	dries:
No. 1 machinery east No. 1 hvy. cast (cupola	\$10.50
size)	9.50
No. 2 cast	8.00
NO. 2 Cast	0.00

*For direct car loading only. †Loading on barge.

BIKMINGHAM					
	Per gross ton delivered consumers'	yards:			
	Heavy melting steel	\$9.00			
	Scrap steel rails Short shoveling turnings	6.50			
	Stove plates 10.00 to				
	Iron axles 10.00 to				
	No. 1 railroad wrought 11.00 to	12.00			
	No. 1 cast 9.50 to Tramcar wheels 9.00 to	9.50			
	Cast iron borings, chem	8.00			

ST. LOUIS Per gross ten delivered sensumers' yards:

Selected heavy steel	\$9.00 to	\$9.50	
No. 1 heavy melting	7.25 to	7.75	
No. 2 heavy melting	7.00 to	7.50	
No. 1 locomotive tires	9.75 to	10.25	
Misc. stand-sec. rails	9.50 to	10.00	
		11.00	
Bundled sheets	6.00 to		
No. 2 railroad wrought	9.00 to	9.50	
No. 1 busheling	5.00 to	5.50	
Cast iron borings and			
shoveling turnings	2.50 to	3.00	
	10.50 to	11.00	
Machine shop turnings	2.50 to	3.00	
Heavy turnings	5.50 to	6.00	
Steel car axles	13.00 to	13.50	
Iron car axles	13.00 to	13.50	
No. 1 railroad wrought	7.00 to	7.50	
	11.75 to	12.25	
Steel angle bars	9.50 to	10.00	
Cast iron carwheels	7.50 to	8.00	
No. 1 machinery cast	8.50 to	9.00	
Railroad malleable	10.00 to	10.50	
No. 1 railroad cast	8.50 to	9.00	
Store plate	6.50 to		
Agricult, malleable	8.50 to	9.00	
DETROIT			
DETROIT			

Dealers'	buying	prices	Ber	gress	\$01	n:	
Heavy m Borings	and sho	rt turn	ings	\$8.50 5.25	to	\$9.00 5.75	

Long turnings	\$4.50 to	85.0
No. 1 machinery cast	10.00 to	10.5
Automotive cast	10.50 to	11.00
Hydraul. comp. sheets		10,00
Stove plate	6.25 to	6,71
New factory busheling	7.50 to	8.00
Old No. 2 busheling	4.50 to	8.00
Sheet clippings	5.50 to	6,00
Flashings		8.00
Low phos. plate scrap	9.25 to	9.71

CANADA		
Dealers' buying prices per g	ress to	on:
T	oronto	Montreal
Heavy melting steel	\$5.50	\$5.50
Rails scrap	6.00	4.50
Machine shop turnings	2.50	2.50
Boiler plate	4.50	4.50
Heavy axle turnings	2,50	1.54
Cast borings	3.00	3.00
Steel borings	2.00	2.04
Wrought pipe	2.50	2.54
Steel axles	4.50	6.00
Axles wrought iron	4.50	6.54
No. 1 machinery cast	7.75	9.00
Stove plate	4.50	5.60
Standard carwheels	7.25	7.00
Malleable	6.75	T.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

	Lake Superior Ores	
	Delivered Lower Lake Ports	
	Per Gross ?	Fon
Old	range, Bessemer, 51.5% iron\$4	.80
Old	range, non-Bessemer, 51.50% iron abi, Bessemer, 51.50% iron	1.65
Mosa	bi, non-Bessemer, 51.50% iron 4	.50
High	phesphorus, 51.50% iron 4	.40

Foreign Ore

2 010 010
C.4.f. Philadelphia or Bultimore
Per Unit
Iren, lew phos., copper free, 55
to 58% iron, dry Spanish or
Algeria 9.50c
Iron, lew phos., Swedish, average
681/2 % iren 9.50c
Iron, basic or foundry, Swedish,
aver, 45% from 9c
Iron, basic er foundry, Bussian,
aver. 65% iron 90
Manganese, Caucasian, washed 52% 260
Manganese, African, Indian, 44-
48%
Manganese, African, Indian, 48-
51% 240
Manganese, Brazilian, 46 to 48% 20c
Per Net Ton Uni
TOT THUS THUS CIVI
Tungsten, Chinese, wolframite, duty
paid, delivered\$17.50 to \$18.5

Tungsten, domestic schoolite, delivered†
Per Gross Ton
Chrome, 45%, Cr2Os, crude, c.i.f. Atlantic Seaboard
Chrome, 48%, Cr2Os, c.i.f. Atlan- tic Seaboard 20.00

Fluorspar

*Quotations nominal in absence of sales. †Nominal; no supplies available.

Per Net Ton
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment\$15.50 to \$16.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines\$15.50 to 16.00
Foreign, 85% calcium fluoride, mal over 5% silicon, c.l.f. Atlantic port, duty paid
98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines

COKE, COAL AND FUEL OIL

		Coke		
		1	er Ne	f Ton
Furnace, Prompt		Connellsville Connellsville		\$3.85
Prompt	1.0.0.	Connensyine	1.60 to	5.10
ovens, i switchin Foundry,	for del g distr by-pre	duct, Chicago livery outside rict		8.50
district		go switching		9.25
England	. deliv	roduct, New		11.00
Foundry, or Jers Foundry,	by-pro by-pro	duct, Newark ty, del'd duct, Phila.	8.20 to	8.81 9.00

Foundry, by-product, Cleve- land, delivered	\$0.25 6.40
Foundry, by-product, St.	
Foundry, by-product, del'd	8.84
St. Louis	9,80

			Coal		Per :	W - 6	
Mine W.	run Pa.	mines.	coal,	f.o.b.			-
W.	Pa.	coking			2.05	to	15
mine	18	%-in.			2.25	te	3.82
min	es .	gas cos			2.05	to	2,4
min	ies.	ck, f.o.			1.55	te	1.60
Gas	slack	. f.o.l	. W.	Pa	1.90	to	2.16

Engl Oil

	ruel Oil
	Per Gal. f.o.b. Bayonne, N. J.
Ne. No.	3 distillate i.m.
	Per Gal. f.o.b. Baltimore
No.	3 distillate 4.000
No.	4 industrial 3.50
	Per Gal. del'd Chicago
No.	S industrial fuel oil 3.30
	Per Gal, f.o.b, Cleveland
No.	3 distillate 5.50
No.	4 industrial
No.	5 industrial

REFRACTORIES

Fire	Clay	Brick

	W.	**	w		e 4		٠,	7	4	D'A	10	-				
						Ĥ	1	gh	1-	he	at	In	ite	rn	Weri edia Bric	į
Pennsylvania	k							\$4	5	.0	0				\$40.5	į
Maryland								4	5	.04	0				49.1	į
New Jersey	,							5	ā	.0	0				45.1	į
Ohio						į,		4	5	.0	0				40.1	Į
Kentucky						į.		- 4	5	.0	0				40.1	Į
Missouri .				ĵ,				4	5	.0	0				40.0	ļ
Illinois									5	.0	0				40.1	J
Ground fire																
ton									7	.0	0					

	C	hrome	Brick Per	Not Tim
Standard	sine			\$45,00

	-	S		i	c	n		1	B	r	i	c	k								
						P	e	r		1	0	10)(9		1	.1	þ,	ð		Wed
Pennsylvania										è					×				*		\$46
Chicago			6.9											0	•	,0			ø	*	55.1
Birmingham Silica clay,		r																			8.

Magnesite Brick

	Per	Net	Tr
Standard size, burned, f.o.b.	Bal	ti-	15 A
more and Chester, Pa Unburned, f.o.b. Baltimore	****		55. O
Baltimore and Chester, Pa. Domestic grain magnesite,			
Baltimore and Charter Pr		1	40.7
Domestic, f.o.b. Chewelah, W.	sed.		-

the dust

Warehouse Prices for Steel Products

Cold-fin. steel bars: Rounds and hexagons 3.5 Flats and squares 3.5	
Plates 3.1. Soft steel bars and small shapes 2.9. Soft steel bars and small shapes 2.9. Sold-finished and strew stock: Rounds and hexagons 3.4. Squares and flats 3.4. Squares and flats 4.1. Squares and flats 9.4. Hoops and bands under 4.1. 25 or more bundles 3.8. Squares and flats 9.4. Hoops and bands under 4.1. 25 or more bundles 3.8. Squares and flats 9.4. Squares and flats 9.4. Squares and flats 9.4. Hot-rolled annealed sheets (No. 24), 25 or more bundles 3.8. Squares (No. 24), 25 or more 3.9. Hot-rolled sheets (No. 10) 2.9. Square (more than 3750 lb.) 2.9. Splics. large 55 per cent off 11. Machine bolts, 100 count, 65 per cent off 11. Nuts, all styles, 100 count, 65 per cent off 11. Large rivets, base per 100 lb. 3. Wire, black, soft ann'l'd, base per 100 lb. Wire, black, soft ann'l'd, base per 100 lb. 20. Wire, solt, base per 100 lb. 2. Common wire nails, per keg 2.2. Common wire nails, per keg 2.2. Common wire nails, per keg 2.2. Common wire splick, structurals, bars, reinford bars, bands, hoops and blue annea sheets, base applied to orders of 400 gives 100 count, 100	
Galv. sheets (No. 24), 25 or more bundles	15e. 15e. 90e. 90e. 45c. 45e. 20e.
Track bolts, all sizes, per 100 count, 65 per cent off il Carriage bolts, 100 count. 65 per cent off il Carriage bolts, 100 count. 65 per cent off il Nuts, all styles, 100 count. 65 per cent off il Nuts, all styles, 100 count. 65 per cent off il Large rivets, base per 100 lb	95c. 95c.
Machine bolts, 100 count, 65 per cent off if Carriage bolts, 100 count, 65 per cent off if Nuts, all styles, 100 count, 65 per cent off if Nuts, all styles, 100 count, 65 per cent off if Large rivets, base per 100 lb	auc.
Object of list styles, 100 count. Large rivets, base per 100 lb	
G5 per cent off il Large rivets, base per 100 lb	list.
bars. bands, hoops and blue anneas sheets, base applied to orders of 400 9999 lb. *Delivered in Pittsburgh switching direct. CHICAGO Base per Plates and structural shapes . 2.9 Cold-fin. steel bars . 2.9 Cold-fin. steel bars: Rounds and hexagons . 3.5 Flats and squares . 3.5 Hot-rolled strip . 3.5 Hot-rolled strip . 3.8 Hot-rolled annealed sheets (No. 24) 3.8	3.50
Base per	aled to
Plates and structural shapes 3.2 Soft steel bars 2.9 Cold-in. steel bars: 2.9 Cold-in. steel bars: Rounds and hexagons 3.5 Flats and squares 3.5 Hot-rolled strip 3.5 Hot-rolled annealed sheets (No. 24) 3.8	
Seft steel bars 2.9 Cold-fin. steel bars: Rounds and hexagons 3.5 Flats and squares 3.5 Hot-rolled sfrip 3.8 Hot-rolled annealed sheets (No. 24) 3.8	Lb.
Hot-rolled sheets (No. 10) 3.0 Spikes (keg lots) 3.5	.95c. .50c. .50e. .30e. .85e. .55e.

n: 45.50 4.50 2.50 2.50 2.60 2.60 2.60 2.50 6.00 6.50 9.00 5.00 7.00

> 8.00 9.00

fat Ton

to \$2.05
to 2.05
to 2.05
to 2.05
to 2.05
to 2.10

J. . 4.00c . 8.50c

3.88c. 3.38c.

Not Ton . . \$45.00

Not Ton ... \$65.00 ... 55.00 ... 65.00

CHICAGO
Base per Lb.
Plates and structural shapes 3,20c. Saft steel bars 2,95c. Cold-fin. steel bars:
Rounds and hexagons 3.50c. Flats and squares 3.50c. Hot-rolled strip 3.30c.
Hot-rolled annealed sheets (No. 24) 3.85c. Galv. sheets (No. 24)
Role Role
Rivets, boiler (keg lots) 3.75c.
Machine bolts
Lag serems
blank
Cup point set screws
wrought washers \$4.50 off list No. 8 black ann'l'd wire per 100 lb., \$3.85
Com. wire nails, base per keg 3.05 Cement c't'd nails, base per keg 5.85
On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base ap- plies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

NEW YORK	
Base per L	d
Plates, in. and heavier 3.40	le.
Structural shapes 3.37	
Soft steel bars, small shapes 3.25	2c.
Iron bars 3.22	
ron bars, swed. charcoal 6.50e to 7.25	
Cold-fin. shafting and screw stock:	
Rounds and hexagons 3.95	2c.
Flats and squares 4.4	2c.
Cold-rolled; strip, soft and quarter	
hard 3.3	2c.
Hoops 3.5	2e.
Bands 3.5.	2c.
Hot-rolled sheets (No. 10) 3.2	70
Hot-rolled ann'l'd shasts (No. 24*) 3 8	50
Falvanized sheets (No. 24°) 4.50	0c.
Salvanized sheets (No. 24°) 4.5 Long terne sheets (No. 24) 5.2	Oc.
Standard tool steel	Oc.
Wire, black annealed (No. 10) 3.2	5e.
Wire, galv. (No. 10)	5e.
fire steel, 1 x 1/4 in. and larger 3.6	5c.
Open hearth spring steel 4.00c, to 10.0	0e.
Common wire nails, base, per keg., \$3.	.21
Don C.	ent
Machine bolts, cut thread: Off L	ist
All diameters	70
Carriage bolts, cut thread:	
All diameters	70
Boiler tubes: Per 100 1	Ft.
Lan welded 2-in 918	0.5
Seamless welded, 2-in 19	.24
Charcoal iron, 2-in 24	.94
Charcoal iron, 4-in 63	.65
4No. 40 and Makes 24 to 10	
No. 28 and lighter, 36 in. wide, 2 higher per 100 lb.	ue.
migner per 100 ib.	
ST. LOUIS	
Base per	T.h
Plates and strue. shapes 3.4	
Bars, soft steel or iron 3.1	
Cold-fin sounds shetting accom	ac.
Cold-fin. rounds, shafting, screw stock 3.7	140
stock 3.7	4C.
Hot-relled annealed sheets (No. 24) 4.0	ac.
Galv. sheets (No. 24) 4.7 Hot-rolled sheets (No. 10) 3.2 Black corrug. sheets (No. 24) 4.0 Galv. corrug. sheets 4.7	9c.
Hot-rolled sheets (No. 10) 3.2	19c.
Sizem corrug, sheets (No. 24) 4.0	e.
Characters of minets	oc.
Structural rivets 3.9	
Boiler rivets 4.0	19e.
Day Cont Off 1	
Tank rivets, 7/16 in. and smaller Machine and carriage bolts, lag screws, fittings up bolts, bolt ends, plow bolts,	55
Machine and carriage bolts, lag screws,	
nttings up bolts, bolt ends, plow bolts,	
hot-pressed nuts, square and hexagon,	
hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts;	
hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts;	
hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts: 1000 lb. or over	10
hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts: 1000 lb. or over	10
tapped or blank, semi-finished nuts:	10

0750	98	and	Mehter	tabe	aneelal	prices	

PHILADELPHIA	lase per Lb
*Plates, 14-in. and heavier	9.95
*Structural shapes	2.950
*Soft steel bars, small shapes,	iron
bars (except bands)	2.90
?Reinforc, steel bars, sq. tw	isted
and deformed	2.955
Cold-finished steel bars	
*Steel hoops	
*Steel bands, No. 12 and 3/16	
Spring steel	
†Hot-rolled anneal, sheets (No.	94) 3.55
†Galvanized alrests (No. 24)	4.25
*Hot-rolled annealed sheets	(No.
10)	3.05
Diam, pat, floor plates, 4 in.	4.95
Swedish iron bars	6.25
These prices are subject to quiferentials except on reinforcing	uantity di
ish iron bars.	and Paec
*Hase prices subject to de	duction o
orders aggregating 4000 lb. or	OTOP
†For 50 bundles or over.	MADE!
IFor less than 2000 lb.	

CLEVELAND
Fiase per Lb.
Plates and strue, shapes 3.31c.
Suft steel bars 2.95c
Reinforc. steel bars
Cold-finished steel bars 3.40c
Flat-rolled steel under ¼ in 3.36c
Cold-finished strip
Hot-rolled annealed sheets (No. 24) 3.96c.
Galvanized sheets (No. 24) 4.61c.
Hot-rolled sheets (No. 10) 3.11c
Hot-rolled 3/16 in. 24 to 48 in. wide
sheets 3.56c
Black ann'l'd wire, per 100 lb\$2.6
No. 9 galv. wire, per 100 lb 3.00
Com. wire nails, base per keg 2.40
month trace security made par mag account and

*Plus mill, size and quantity extras. †Outside delivery 10c, jess.

CINCINNATI
Base per Lb.
Plates and strue. shapes 3.40e.
Bars, soft steel or iron 3.15c.
New billet reinforc. bars 3.25c.
Rail sizel reinforc, bars 3.25c.
Hoops and bands, 3/16 in. and
lighter 3.45c.
Cold-finished bars 3.70c.
Hot-rolled annealed sheets (No. 24) 4.00c.
Galv. sheets (No. 24) 4.70c.
Clair, michie (140, 21)
Hot-rolled sheets (No. 10) 3.20c.
Structural rivets 4.35c.
Small rivets
No. 9 ann'l'd wire, per 100 lb. (1000
lb. or over)
Com. wire nails, base per keg (1
to 24 kegs) 3.50
25 to 50 kegs 3.30
Larger quantities 3.10
Cement c't'd nails, base 100-lb. kag 3.50
Chain, 1-in., per 100 lh 8.35
Net per 100 Ft.
Seamless steel boiler tubes, 2-in. \$19.03
Lap-welded steel boiler tubes, 2-in, 18.10
A. to A. to

BUFFALO	
Base per l	Lb.
Plates 3.2	
Struc. shapes	
Reinforcing bars 2.6	Øε.
Cold-fin. flats and sq 3.5 Round and hex 3.5	56.
Cold-rolled strip steel 3.1	9e.
Hot-rolled annealed sheets (No. 24) 4.0 Heavy hot-rolled sheets, 3/16 in.	oc.
24 to 48 in. wide 3.6	2c.
Galv. sheets (No. 24)	
Hoops 3.4	12e.
Hot-rolled unannealed absets 3.1 Com. wire nails, base per keg \$3	
Black wire, base per 100 lb 3.5	

BOSTON	
Per Lb. Base Beams, channels, angles, tees, mass 3.52c. H beams and shapes	
mill, 1/4 in. thick and heavier 3.53c. Floor plates, diamond pattern 5.33c. Bar and bar shapes (mild steel) 3.30c. Hands 3/16 in. thick and	
No. 12 ga. inel	
Tire steel 4.55c. Cold-finished rounds and hexagons 5.25c. Cold-rolled strip steel 3.245c. Cold-finished squares and flats 4.30c.	
Blue annealed sheets, No. 10 gal 3.60c. One pass cold-rolled sheets No. 24 ga. 4.15c. Galvanized steel sheets, No. 24 ga. 4.85c.	
Prices delivered by truck in metropolitan	

8	delivere	d b	y truck in	metropolita
	subject	to	quantity	differentials

PACIFIC	CO	AST	
		ase per L	b.
		Los Angeles	Seattle
Plates, tank and U. M. Shapes, standard Soft steel hars Reinforcing bars Hot-rolled annealed	3.55c. 3.60c.	3.70e. 3.70e.	3.55e. 3.60c.
sheets (No. 24)		4.45e.	4.40c.
Hot-rolled sheets	3.75c.	5.80c.	3.75c.
Galv. absets (No. 24) Cold finished steel:	5.00d.	5.05c.	5.00e.
Rounds	5.95a	5.95c.	4.75c.
hexagons Flats Common wire nails	7.70e.	7.20e. 7.70e.	6,00c. 7,00c.
base per keg less carload	. \$3.4	0 \$3.25	\$17.50
All items subject quantity.	to d	lifferenti	als for

November Business Back To August Levels

BUSINESS conditions were slightly improved in November. The upturn during the month added to the gain in October brought the level of activity to where it was in August, according to the monthly report of the conference of statisticians in industry of the National Industrial Conference Board.

Production in major industries recorded a moderate net advance over seasonal expectations. General distribution and retail trade showed only partial improvement in November as compared with October. Commodity and security prices advanced a little while the cost of living eased off again.

Industrial production showed mixed movements with a resulting net gain.

Automobile output declined in an approximately seasonal manner. Steel and iron production showed sizable gains in November over October, although downturns are usual at this time of the year. Textile activity during November maintained the relatively high post-strike level of October. Electric power output was increased more than seasonally. Building construction awards as a whole fell off a little more than seasonally, and residential awards, in declining failed to maintain the upturn observed in October.

Bids Asked for Navy Yard Bars

WASHINGTON, Dec. 24.—The Bureau of Supplies and Accounts will open bids Jan. 4 for 150 tons of steel bars for delivery at the Washington Navy Yard.

Plant Modernization Loans Considered

WASHINGTON, Dec. 24.—Handling of loans for use in financing modernization of industrial plants is said to be under contemplation by the Federal Housing Administration. The money would be loaned for the purchase of new machinery, for which it has been declared there is a potential requirement of \$3,000,000,000 to \$4,-000,000,000. Apparently the plan is to make the FHA provision broader than the loan provision of the RFC, which provides funds for the purchase of new equipment also. The reported plan of the FHA is to handle mortgages with a discounting outlet under a plant modernization insurance plan similar to those for housing.

Lead Prices Remain Firm at 3.70c.— Spelter Sales Poor as Prices Drop 50c.

Copper Bookings Now Total 12,000 Tons for December; Foreign Users Purchase First Quarter Supplies at 7c.—Tin Inactive

EW YORK, Dec. 24.—Users of electrolytic copper are purchas-ing steadily in moderate amounts, and December bookings to date are around 12,000 tons. though this tonnage is comparatively good, much higher sales volume and additional reduction of reserve stocks are necessary before this market will have a healthy appearance. Blue Eagle metal seemingly firmly fixed at 9c. a lb., Valley, few fabricators are interested in expanding their copper inventories. Likewise the developments in world markets are having little influence on sentiment here, as users expect to receive ample warning before any shift is made in the code-established price In England the scheduled meeting of copper producers early in

the first quarter for possible price adjustment is being reflected in consumer and professional sales for first quarter. Metal is still available there at 7c. a lb., c.i.f. usual Continental base ports, for January-March delivery, but some sellers are very hesitant to deliver beyond March at the 7c. level. During November world copper statistics showed a stock decline of 13,500 tons, although most of the reduction came from a revision of October statistics. World stocks now stand at around 483,500 tons.

Tin

Spot Straits eased off fractionally during the week at New York, although the market was exceedingly inactive as a reflection of the usual dullness ruling before the Christmas and New Year periods. Importers look for a return of a moderate amount of demand early in the new year. This outlook is based on the encouraging operations of the American tin plate industry. No London price is available in New York today as the Commodity Exchange is closed. However, leading sellers have tained the Friday quotation of 50.90c. a lb., New York, for what little business that is coming in. The latest statistics show that apparent consumption of tin in the United States for the year ended October, 1934, has decreased 26.2 per cent, although the actual use of tin in manufacture was 57,370 tons, which was approximately equal to the quantity used in the previous yearly period.

Lead

Last week's rush of consumers to stock January lead on a rising market served to relieve most producers of their excess intakes. However, buying has waned considerably in the last few days under holiday influences. The present price of 3.70c. a lb., New York, and 3.55c., St. Louis, is quite firm, and if any change from this level occurs it will probably be in an upward direction. All consumers have been in the market for supplies, and January is considered to be approximately two-thirds sold. A few are committed light for February although books are not yet oficially open. Inasmuch as recent sales have been mostly for January delivery, the supposition is that users are well covered for December and early January, but are purchasing in the belief that metal at the prevailing quotations is a good "buy." Tri-State lead concentrate has advanced \$2 a ton in sympathy with refined metal.

Zin

Following the heavy bookings of two weeks ago, new business in the past seven-day period consisted mostly of car-lot demands from regular customers. As the scene shifted to a buyers' market, quotations exhibited weakness and some sellers offered first quarter tonnages 50c. a ton lower late last week. The whole market is now at this lower level, although 3.75c., East St. Louis, is being generally quoted for deliveries beyond March. Even with most consumers fairly well covered, the sensitive spelter market should not show much additional price weakness. The Joplin concentrate market is apparently in a good condition, which should be improved if mines adhere to their plans to curtail output during the holiday period. Buyers of concentrates have taken all the material available at \$25 and \$26 a ton respectively for flotation and coarse grades. Sales advanced to 6180 tons, output amounted to 7950 tons in the week, and total bin stocks are now only slightly higher.

The Week's Prices. Cents Per Pound for Early Delivery

	Dec. 19	Dec. 20	Dec. 21	Dec. 22	Dec. 24
Electrolytic copper, N. Y.*	8.75	8.75 .	8.75	8.75	8.75
Lake copper, N. Y	9.12 1/2	9.12 1/2	9.121/2	9.12 1/2	9.12 1/2
Straits tin, Spot, New York	50.95	50.90	50.90	* * * * * * * * * * * * * * * * * * * *	50.90
Zinc, East St. Louis	3.75	3.72 1/2	3.72 1/2	3.72 1/2	3.721/2
Zinc, New York	4.10	4.07 1/2	4.07 1/2	4.071/2	4.07 1/2
Lead, St. Louis	3.55	3.55	3.55	3.55	3.55
Lead, New York	3.70	3.70	3.70	3.70	3.70

*Refinery quotations; price ¾c. higher delivered in Connecticut.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a ib., delivered.

Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a ib., average for week.

Nickel electrolytic cathode, 35c. a ib., delivered; shot and ingot, 36c. a ib., delivered.

Antimony, 13.75c. a ib., New York.

Brass ingot, 85-5-5-5, 8.25c. a ib., New York and Philadelphia.

From	New	York	Warehouse	

From New York Warehous	se •
Delivered Prices, Base per	Lb.
Tin, Straits pig52.50c. to	53.50c.
Tin, bar	
Copper, Lake 10.25c. to	11.00c
Copper, electrolytic 10.00c. to	10.50c
Copper, castings 9.75c. to	
*Copper sheets, hot-	10.100.
rolled	16,00c.
	14.25c.
	16 950
*Seamless copper tubes *Brass rods	19.250.
Zinc, slabs 5.75c. to	0.75C.
Zinc, sheets (No. 9),	
casks, 1200 lb. and	10.05-
	10.25c.
Lead, American pig 4.37 1/2 c. t	
Lead, bar	0 6.37 %
Lead, sheets	7.25c.
Antimony, Asiatic15.50c. to	16.50c.
Alum., virgin, 99 per	
cent, plus	23.30c.
Alum., No. 1 for remelt-	
ing, 98 to 99 per cent. 18.00c. to	19.00c.
Solder, 1/2 and 1/2 31.00c. to	32.00c.
Babbitt metal, com-	
mercial grades 25.00c. to	60.00c.
*These prices are also for deliv	zery fron

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

	2000		-	1000	gro.	W 0.1
Tin, Tin,	Straits bar	pig				55.37 ½ c.

Copper, Lake10.00c.
Copper, electrolytic10.00c.
Copper, castings 9.75c.
Zinc, slab
Lead, American pig4.70c. to 4.95c.
Lead, bar 7.75c.
Antimony, Asiatic
Babbitt metal, medium grade 18.50c.
Babbitt metal, high grade59.37 1/2 c.
Solder, 1/2 and 1/2 33.00c.

Old Metals. Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Buying Prices	Selling Prices
Copper, hvy. crucible. Copper, hvy. and wire Copper, light and bot-	5.50c. 5.37 1/2 c.	6.25c. 5.87½c.
toms Brass, heavy Brass, light	4.37 ½ c. 2.87 ¼ c. 2.12 ¼ c.	4.87 ½ c. 3.50c. 2.87 ½ c.
Hvv. machine com- position	4.37 %c.	4.87½c.
ings	3.75c.	4.25c.
compos. turnings Lead, heavy	4.00c. 2.62 ½ c.	
Zinc Cast aluminum Sheet aluminum	1.87 ½ c. 9.62 ½ c. 11.00c.	2.25c. 10.75c. 12.50c.

Award

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State of highway, through tractor.

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Awards 2760 Tons—New Projects 5650 Tons

Norwood, Mass., 103 tons, bridge, to Trus-

State of Rhode Island, 150 tons, mesh for highway, to American Steel & Wire Co. through Lane Construction Co., general contractor.

Ulster County, N. Y., 150 tons, highway, to Kalman Steel Corpn.

Muscatine, Iowa, 1200 tons, dam across Mississippi River, to Inland Steel Co.

St. Louis, 250 tons, Kingshighway underpass on highway route 40, to Laclede Steel Co.

San Francisco, 500 tons additional, George Washington school, to Pacific Coast Steel Corpn.

Sebastopol, Cal., 187 tons, school, to Soule Steel Co.

Folsem, Cal., 100 tons, prison cell work, to Palm Iron & Bridge Co.

France Field, C. Z., 116 tons, non-commissioned officers' quarters at Army Base, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Baltimere, 1000 tons, housing project; Arundel Corpn. low bidder on general contract.

Atlanta, Ga., 1000 tons, housing project; J. A. Jones Construction Co., Charlotte, N. C., low bidder on general contract.

Michigan City, Ind., 500 tons, water plant.

Chicago, 1000 tons, contract No. 2 for Sanitary District.

St. Louis, 250 tons, Page Avenue viaduct, Skrainka Construction Co., St. Louis, low bidder on general contract.

Zanesville, Ohio, 1000 tons for Muskingum Valley Conservancy District; bids Jan. 7.

San Francisco, 239 tons, Visitation Valley school; new bids Jan. 9.

San Francisco, 400 tons, Caswell Coffee Co. building, general contract awarded.

Los Angeles, 200 tons, two buildings at Manual Arts high school.

Altadena, Cal., 100 tons, school alterations, hids under advisement.

Long Beach, Cal., 200 tons, Robert Louis Stevenson school; general contract awarded.

Seattle, 150 tons, city light building.

Lewis County, Wash., 100 tons, Bureau of Public Roads bridge over Laughing Water Creek; bids Jan. 4.

Pipe Lines

Blackwell, Okla., plans 31,700 ft. 16-in. steel pipe (with alternate bids on cast iron pipe) for raw water supply; also pumping station and other waterworks equipment. Fund of \$100,000 has been arranged. C. K. Bullen, superintendent of Public Utilities Department, in charge.

United States Engineer Office, Wilmington, N. C., closes bids Dec. 28 for eight pieces of 30-in. steel suction pipe (Circular 99).

Springfield, Ohio, plans about 8000 ft. of 42 to 48-in, steel pipe (with alternate bids on cast iron and concrete) for trunk water system. Fund of \$1,462,000 is being arranged for waterworks extensions and improvements, including new water-softening, filtration and purification works.

Butte Falls, Ore., closed bids Dec. 19 on 5950 ft. of 4 and 6-in. steel pipe, with alternates on cast iron, for water line. D. T. McDonough, City Hall, Medford, Ore., is consulting engineer.

Ogden, Utah, plans 35-in. steel pipe line from Black Point through Ogden Canyon, and new 48-in. steel pipe line connecting with 38,000,000-gal. reservoir to be constructed for



water supply. Fund of \$750,000 has been arranged through Federal aid for water system extensions and improvements. Claude Coray is city engineer. Bids will be asked soon.

Worthington Gas Co., Worthington, Minn., E. O. Olson, president, will soon take bids for welded steel pipe from Sioux Falls, S. D., to Worthington, by way of Luverne and Adrian, Minn., for natural gas service at three last noted places; also plans branch steel pipe lines to Pipestone, Fulda and vicinity for similar purpose, with installation of distribution lines in communities noted.

Bronx Waterworks Corpn., 1 Riverdale Avenue, Bronx, New York, let contract to Alco Products Co., 220 East Forty-second Street, for 700 tons of 72-in. steel pipe for water mains for Department of Water Supply, Gas and Electricity, Municipal Building, which recently made award to first noted company for pipe and installation at \$148,000.

Los Angeles has placed 170 tons of 18-in. steel pipe for Water and Power Department with Western Pipe & Steel Co.

Railroad Equipment

Seaboard Air Line is inquiring for three locomotive tenders.

Key System, Ltd., is inquiring for 10 to 25 two-car, three-truck, four-motor, all-steel articulated units for service on new San Francisco-Oakland bridge.

Liquid Carbonic Corpn. is inquiring for five steel-sheathed box cars.

Lehigh Valley has ordered 250 mill type gondola cars from Bethlehem Steel Co.

Gold Coast Railroad Co., care of G. E. Gale. Port Orford, Ore., has applied to Interstate Commerce Commission for authority to build a 35 mile railroad between Port Orford and Leland, Ore.

Department of Water and Power, Los Angeles, has ordered 12 locomotives from Atlas Car Mfg. Co.

The Iron Age, December 27, 1934-53

Fabricated Structural Steel

Awards Slightly Higher-New Projects Decline

TRUCTURAL steel bookings of 11,200 tons compare with 10,650 tons last week. Among the sizable lettings are 2500 tons of structural and 2800 tons of sheet piling for a dam in the Mississippi River at Muscatine, Iowa, 1600 tons for a library building for the University of Texas at Austin, Tex., and 1400 tons each for a bridge in Broome County, N. Y., and the Le Flore-Sequoia bridge in Oklahoma. New projects of 7400 tons compare with 8600 tons in the previous week and 8100 tons two week ago. The largest new job reported is 2200 tons for Pier 45 in New York City. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Somerville, Mass., 311 tons, Mystic River bridge, to Wisconsin Bridge & Iron Co.

New York, 410 tons, Willard Parker Hospital laboratory building, to Bethlehem Fabricators, Inc.

Jamaica, N. Y., 400 tons, public school No. 48, to American Bridge Co.

East Rockaway. N. Y., 270 tons, high school building, to Bethlehem Fabricators, Inc.

Spencer, N. Y., 125 tons, State highway bridge, to American Bridge Co.

Broome County, N. Y., 1400 tons, highway bridge, to American Bridge Co.

East Rockaway, N. Y., 285 tons, school, to Bethlehem Fabricators, Inc.

New York, 270 tons, Herald-Tribune building alterations, to George A. Just Co.

Ulster County, N. Y., 120 tons, highway bridge, to Harris Structural Steel Co.

Succasunna, N. J., 105 tons, bridge, to American Bridge Co.

Georgetown, Del., 100 tons, school building, to Modern Iron Works.

Edge Moor, Del., 135 tons, tanks for Krebs Pigment & Color Co., to Pittsburgh-Des Moines Steel Co.

Cumberland, Md., 190 tons, building for Celanese Corpn. of America, to McClintic-Marshall Corpn.

SOUTH AND SOUTHWEST

Glasgow, Va., 390 tons, factory building for Blue Ridge Co., to Belmont Iron Works, previously reported as an unnamed fabricator.

Eufaula, Okla., 475 tons, bridge, to Mc-Clintic-Marshall Corpn.

State of Oklahoma, 1400 tons, La Flore-Sequoia highway bridge, to Wisconsin Bridge & Iron Co.

Austin, Tex., 1600 tons, University of Texas library building, to Mosher Steel Co., Houston, Tex.

CENTRAL STATES

Hamilton, Mich., 150 tons, State highway bridge, to McClintic-Marshall Corpn.

Muscatine, Iowa, 2500 tons, dam acros Mississippi River, to R. C. Mahon Company.

Muscatine, 2800 tons, sheet piling, dam agross the Mississippi River, to Inland Steel Co.

Wausau, Wis., 100 tons, school, to Wausau Iron Works.

Sioux Falls, S. D., 100 tons, school, to Haffenstein Steel Co.

State of Kansas, 100 tons, Brown County highway bridge, to St. Joseph Structural Steel Co.

Bates County, Mo., 215 tons, bridge, to Missouri Valley Bridge & Iron Co.

WESTERN STATES

Oakland, Cal., 2300 tons, Alameda County court house, award recommended to Pacific Coast Steel Corpn. San Francisco, 100 tons, warehouse, to Pacific Coast Steel Corpn.

Plumas County, Cal., 305 tons, State bridge over Feather River, to Moore Dry Dock Co.

Sutter County, Cal., 125 tons, State bridge over Tisdale Weir, to Pacific Coast Steel Corpn.

Los Angeles County, Cal., 100 tons, three buildings at County Farm, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS NORTH ATLANTIC STATES

New York, 2200 tons, Pier 45.

State of Pennsylvania, 970 tons, highway bridges.

Unadilla, N. Y., 250 tons, State highway bridge.

SOUTH AND SOUTHWEST

Atlanta, Ga., 150 tons, housing project.

Bradford, Ark., 225 tons, bridge.

CENTRAL STATES

Gary, Ind., 300 tons, grade crossing elimination for New York Central Railroad.

Chicago, 550 tons, two industrial buildings.

Sterling, Ill., 375 tons, industrial building.

State of Illinois, 325 tons, bridges.

Lockport, Ill., 150 tons, head gates and racks for Sanitary District.

State of Illinois, 330 tons, bridges; bids open Jan. 4.

Ottumwa, Iowa, 1600 tons, bridge; Wisconsin Bridge & Iron Co., low bidder.

Rochester, Minn., 350 tons, power plant.

Winona, Minn., 2400 tons, dam across Missisppi River; McClintic-Marshall Corpn. low bidder.

Moscow, Kan., 150 tons, bridge.

State of Kansas, 135 tons, Grant County highway bridge; bids opened Dec. 22.

St. Louis, 541 tons, Page Avenue viaduct, Skrainka Construction Co., St. Louis, low bidder on general contract.

WESTERN STATES

Gardiner, Mont., 190 tons, Government utility building.

San Francisco, 500 tons, junior high school gymnasium.

Pittsburg, Cal., 100 tons, school.

Juneau, Alaska, 100 tons, Lemon Creek bridge; general contract awarded.

FABRICATED PLATE

AWARDS

Lowell, Mass., 367 tons, stand pipes, to McClintic-Marshall Corpn.

Hot Springs, Mont., 100 tons, city tank, to Pittsburgh-Des Moines Steel Co.

NEW PROJECTS

Fort Peck, Mont., 300 tons, plates for fabricating 480 12-ft. lengths of 28-in. diameter steel pipe for reservoir dam on Missouri River; McClintic-Marshall Corpn., low bidder.

Cast Iron Pipe

Westfield, Mass., will close bids Dec. 28 on 120 tons of 12-in. Oren E. Parks is superintendent of Board of Public Works. Rai

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Chicago has awarded 100 tons of 6-in. to Glamorgan Pipe & Foundry Co.

Jackson, Mich., will purchase 250 tons of pipe and fittings for sewage disposal plant.

Gretna, Va., plans water pipe line system. Fund of \$63,000 has been secured through Federal aid for this and other waterworks equipment, including pumping station and filtration plant.

Seneca, Mo., plans pipe line extensions and replacements for water supply. Bond issue of \$42,000 has been authorized for this, elevated tank and tower, and other waterworks construction. Albert C. Moore, Fourth and Duquesne Streets, Joplin, Mo., is consulting engineer.

Boulder, Colo., will ask bids in January for about 5000 ft. for water trunk line from Boulder Canyon. Cost about \$20,000. H. C. McClintock is city manager.

Blossom Prairie, Tex., plans water pipe lines. Fund of \$40,000 has been secured through Federal aid for this and other waterworks construction.

Pataskala, Ohio, will soon take bids for pipe for water system; also for elevated storage tank and tower and pumping equipment. Burgess & Nipple, 568 East Broad Street, Columbus, Ohio, are consulting engineers.

Westmont, III., plans about 5500 ft. of 6-in. and quantity of smaller pipe for water system; also deep-well pumping equipment, Fund of \$60,000 has been arranged. Charles DeLeuw & Co., 20 North Wacker Drive, Chicago, are consulting engineers.

Walnut Grove, Minn., closes bids Jan. 7 for 1930 ft. of 4 and 6-in. fittings, hydrants, etc. A. W. Olson is village clerk.

Richmond, Tex., closes bids Dec. 28 for 11,700 ft. of 4, 6 and 8-in. and 18,000 ft. of 2 and 2½-in. galvanized pipe for water supply. David M. Duller, Second National Bank Building, Houston, Tex., is consulting engineer.

Santa Anna, Tex., will soon take bids for 21,700 ft. of 4 to 10-in. for water system. M. M. Moseley & Associates, Coleman, Tex., are consulting engineers. Fund of \$35,000 has been arranged.

Fredonia, Kan., plans water pipe line system. Bonds for \$80,000 are being voted for this and reservoir construction.

Magdalena, N. M., plans water pipe line extensions and replacements. Fund of \$59,000 has been arranged for this and other waterworks improvements. New Mexico Engineering Co., Springer Building, Albuquerque, N. M., is consulting engineer.

San Francisco has purchased \$16,875 worth of cast iron special from Vernon Foundry Co.

Lynwood, Cal., has awarded 170 tons of 6 to 12-in. to American Cast Iron Pipe Co.

Hot Springs, Mont., let contract for 405 tons of 2 to 8-in. to Pacific States Cast Iron Pipe Co.

Bureau of Reclamation at Ogden, Utah, bought 230 tons for Pine View dam.

Emery Town, Utah, has been granted a loan for water system improvements which call for 124 tons of 2 to 6-in. W. R. Wayman, Price, Utah, is engineer.

Orem, Utah, will take bids soon on 634 tons of 8 and 12-in.

fleber City, Utah, plans installation of 4800 ft. and construction of a reinforced concrete reservoir with PWA loan.

Price, Utah, will replace five sections of existing water line with steel and cast iron pipe with a loan received from PWA.

Tubular Service Corpn., which has for some time stocked mechanical tubing made by Steel and Tubes, Inc., Cleveland, in warehouses in New York, Philadelphia, and Boston, has recently begun to carry stocks of Electrufite boiler tube in its warehouses at New York and Philadelphia.

Railroads Studying Freight Car Movement

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THE railroads of the United States are making the most widespread and, at the same time, the most detailed check ever undertaken of the actual daily use of the 2,000,000 freight cars in the country, according to an announcement by J. J. Pelley, president of the Association of American Railroads. This first nation-wide record of how cars move, and why, is made under the direction of the association in order to discover what improvements, if any, can be made in the present system of handling freight cars.

Every movement of each freight car is being recorded for a two weeks' period by men in a position to know the facts of each particular movement, from reports of freight conductors, local station agents, yard masters and clerks, car distributers and dispatch-These individual records, which will present a far more complete picture than routine statistical reports of car mileage, loaded and empty, are being put together by each railroad, and will be reported to the Association of American Railroads. There the combined picture will be analyzed to determine how to get the fullest and most economical use out of cars without impairing the present high standard of service under which the old periodical car shortage has disap-peared, even in the years when freight loadings exceeded a million cars a week.

Frigidaire Spends Large Sum for Improvements

PROSPECTS for the refrigeration and air-conditioning industries are so bright for 1935 that Frigidaire Corpn., Dayton, Ohio, has retooled its two plants and installed new machinery at a cost of \$1,600,000 to meet an anticipated increased sales volume.

Non-Union Votes in Majority at Cadillac

N the election at the Cadillac Motor Car Co., Detroit, the first to be held under the supervision of the Automobile Labor Board, 1176 out of 1593 workers who voted did not designate affiliation with any union or employees' association. The plant has 2300 eligible voters. The Cadillac Employees' Association was named by 152 workers and the American Federation of Labor by 94. Among the 32 nominees in the 16 voting districts, who will be candidates at the final election, were Elmer E. Collins, president of the A. F. of L. local union, and Father Coughlin. The latter has indicated that it will be impossible for him to serve if elected.

NON-SHRINK, OIL HARDENING

TOOL STEEL
TUBING

The job of making ring dies, cutting dies, bushings, spacers, etc., is half done when you start with Bissett Tool Steel Tubing. There is a size carried in stock to meet every requirement up to 12" O.D. and 2" wall thickness. Larger sizes can be supplied.

It eliminates forging, does away with annealing difficulties and cuts down machining cost.

We also supply special tubing to S.A.E. 52100 and S.A.E. 4615 analysis for Ball Bearing purposes.

Monufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

THE BISSETT STEEL COMPANY

945 E. 67th STREET, CLEVELAND, O.

Cincinnati

Chicago

Philadelphia

On the Assembly Line

(Continued from Page 37)

dard sixes will be that the latter has conventional springing, whereas the de luxe will have knee-action. All Pontiacs will be equipped with hydraulic brakes. This leaves Chevrolet and Buick as the only hold-outs in General Motors against hydraulic brakes. Pontiac, of course, is looking to its sixes rather than its eight for volume the coming year.

Chevrolet Watches Trend

Chevrolet is said to be thinking about a "thrift" car, but it will start the year with only the Master and the Standard. Most of its January output will be Standards and trucks, but 70,000 Masters are reported scheduled for February. Chevrolet is prepared to shift major emphasis to either the Standard or Master, according to the whims of the buyer. It has a strong hunch, as indicated in this column a week ago, that the Standard will sell in large volume.

Reo will present at the New York show a new lighter Flying Cloud six, equipped with the Reo-patented self-shifter transmission, seven-bearing engine and hydraulic brakes. Graham introduced its light six on Saturday. The LaFayette will have "synchronized springing." It will retain the conventional front axle, but will fit between the polished ends of the front and rear spring leaves patented friction-controlling inserts which require no lubrication.

Steel buying has included heavy tonnages from Ford, covering January needs and releases for 25,000 jobs from Oldsmobile. Hupp has purchased steel for 2000 jobs. Chrysler plants are pushing steel suppliers for prompt deliveries.

It is understood that the new car to be built by Packard will carry the Packard name. Evidently the Packard management has remembered the fate which befell companion cars with newly-coined names, such as the Erskine, Viking, Rockne and Marquette. It is not unlikely that the new Packard will have a base price lower than many people predict. It is reported to have independent springing, using coil springs.

Following the precedent set a year ago, Henry and Edsel Ford will speak to dealers over an international telephonic hook-up on Thursday, two days before the new V-eight is to be shown publicly. The 1935 Ford has wider seats and 8 in. more body room. The body reflects the current tendency toward streamlining. The radiator is narrow. Many refinements have been made in the car.

Detroit Notes

Pig iron shipments in December to automotive foundries are running 25 to 30 per cent ahead of November.

... W. J. McAneeny, former president of Hudson Motors, has been named president of Hupp.

... Most car manufacturers are using considerably more stainless steel on 1935 models than on previous lines.

Detroit's industrial employment index stood at 84 on Dec. 15, compared with 62.4 on Nov. 30 and 51.2 on Dec. 15, 1933. It is at the highest point for this time of the year since 1929. In the first half of December employment made the sharpest gain since January, 1931.



Year End Brings Brighter Machine Tool Prospect

ESPITE the usual dullness of the pre-holiday season, machine tool makers are looking forward cheerfully to the next year's first quarter. Inquiries are encouraging and of firmer tone.

A Middle Western tool builder has sold this week eight turret lathes for shipment to Italy and three for Japan and is figuring on some sizable domestic business.

Ford of England is buying considerable equipment in the United States and already has placed some orders, the largest of which involved about \$50,000. Further purchases are expected in the immediate future. This buying is being done by an official of Ford of England who is making his headquarters at the Rouge plant at Dearborn. Ford is pressing machinery builders for delivery of equipment for increased production at Rouge. Prospects are bright for extensive machine tool purchases in the automobile industry early in 1935. Such buying will be necessitated by the urge to effect manufacturing economies and by the desire to increase output, if predicted sales volume materializes.

♦ NORTH ATLANTIC ▶

Colonial Beacon Oil Co., Inc., 155 East Forty-fourth Street, New York, plans new bulk oil storage and distributing plant at Nissyuna, near Schenectady, N. Y. Cost about \$75,000 with steel tanks, pumping plant and other equipment.

Wahl Electric Co., 116 University Place, New York, electrical products, has leased floor in building at 128 University Place for new works and headquarters.

Bissell Mfg. Co., Inc., Rockville Centre, L. I., has been organized by E. Bissell Chaffee, 7 Fairview Avenue, Baldwin, N. Y., and associates, to manufacture air-conditioning equipment and devices.

Signal Supply Officer, Army Base, Brooklyn, asks bids until Jan. 14 for 11,200 ft. cable and seven reels (Circular 65).

Atlantic Refining Co., 260 South Broad Street, Philadelphia, has let general contract to Holcombe Anthony, 523 Clinton Avenue, Albany, N. Y., for first unit of new bulk oil storage and distributing plant at Rensselaer, N. Y. Cost over \$75,000 with equipment. Entire project will cost close to \$150,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 8 for ventilating fans and spare parts (Schedule 3987), seven grinders and seven scaling hammers (Schedule 3995), steering gears, windlasses, capstans and spare parts (Schedule 3981) for Brooklyn, Philadelphia and Charleston Navy Yards; until Jan. 11, 41,950 lb, wire solder for Brooklyn, Sewall's Point, Great Lakes, Mare Island and other yards (Schedule 3986), 12 indicating type pyrometers and spare parts for Brooklyn, Philadelphia, Poston and Puget Sound yards (Schedule 3991).

Laundri-Matic Corpn., Mount Vernon, N. Y., has been organized by Arthur A. Berard, 101 Elm Avenue, Mount Vernon, and John W. Chamberlin, 27 Casterton Avenue, Akron. Ohio, to manufacture washing machines and parts. Henry Steers, Inc., foot of Java Street, Brooklyn, contracting engineer, has filed plans for one-story building for equipment storage and distribution. Cost about \$50,000 with machinery. W. D. Malcolm is company architect.

Public Works Officer, Building No. 3, Navy Yard, Brooklyn, asks bids until Jan. 7 for furnishing and erecting two 10-ton 66-ft. span electric bridge cranes on present crane runway, Shipways No. 2, local navy yard (Specification 7806).

Essex County Board of Freeholders, Hall of Records, Newark, N. J., plans extensions and improvements in power plant at Overbrook Hospital, Cedar Grove, N. J., including new generating units and other equipment. Fund of \$125,000 has been secured through Federal aid. Runyon & Carey, 31 Fulton Street, are consulting engineers.

Monmouth Iron Works, Inc., Long Branch, N. J., has been organized by Harry Trian and Joseph Schwark, Long Branch, care of Julius J. Golden, 156 Long Branch Avenue, representative, to manufacture metal products, and operate a general iron works.

Great Eastern Stove Works, Newark, N. J., has leased a floor in building at 56 East Bigelow Street, for manufacture and repair of stoves and ranges.

Carl J. Bischoff, 710 Bangs Avenue, Asbury Park, N. J., city manager, asks bids until Jan. 3 for settling tanks, sludge digestion tank, ventilating stack and other equipment for a sewage treatment plant. Remington, Vosbury & Goff, 509 Cooper Street, Camden, N. J., are consulting engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 4 for 304,000 lb. steel rivets, and 6625 lb. steel tap rivets (Schedule 3966), tool steel (Schedule 3959), steel shapes (Schedule 3983); until Jan. 8, 85,500 lb. tool steel (Schedule 4001) for Philadelphia Navy Yard.

Borough Council, Myerstown, Pa., plans new municipal electric light and power plant. Cost over \$90,000 with equipment.

♦ NEW ENGLAND ▶

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 8 for 41,500 lb. manganese-nickel bars (Schedule 3975) for Boston, Philadelphia, Puget Sound and other navy yards; until Jan. 11, 29,000 tinned plate containers (Schedule 4005) for Newport, R. I., yard.

National Oil Burner Co., Whitman, Mass., has been organized by George J. J. and G. Loring Clark, West Hanover, Mass., to manufacture oil burners and oil-burning equipment.

Revere Sugar Refinery, 15 Broad Street, Boston, has leased building at Park and Ivaloo Streets, Somerville, Mass., for storage and distribution.

Seltzer & Rydholm, Inc., 244 Minot Avenue, Auburn, Me., beverages, has let general contract to J. A. Greenleaf & Sons Co., 20 Washington Street, for new one-story mechanicalbottling works. Cost over \$25,000 with equipment. Stanley S. Merrill, 9 Vine Street, is architect.

Public Works Officer, Building 39, Navy Yard, Charleston, Boston, plans and improvements at navy yard, including addition to structural shop and extensions in shipways. Cost about \$500,000 with equipment. Appropriation will be arranged.

Board of Selectmen, Uxbridge, Mass., plans manual training department in new multistory high school. Cost \$175,000. Bids will be asked soon. Theodore J. Brodeur, 83 Gates Street, Worcester, Mass., is architect.

■ BUFFALO DISTRICT

Acheson-Graphite Co., Niagara Falls, N. Y., a subsidiary of Union Carbide & Carbon Corpn., New York, is erecting a plant addition. Cost over \$70,000 with equipment.

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C. Roy Curtis & Son, Inc., Marion, N. Y., has been organized by C. Roy and C. Albert Curtis, Marion, to manufacture farm machinery and implements.

Ontario Hydro-Electric Power Commission, Toronto, Ont., has approved plans for new high-tension power substation at Timmins, Ont., for gold-mining service in that district, including transmission line for connection with present system. Cost over \$150,000 with equipment.

Steel Co. of Canada, Ltd., Hamilton, Ont., has let general contract to Hamilton Bridge Co., Ltd., Hamilton, for one-story additions. Cost over \$100,000 with equipment. Company is also planning addition to mill at Joliette, Ont., to cost about \$50,000 with equipment.

◆ OHIO AND INDIANA ▶

Department of Public Utilities, City Hall. Cleveland, has plans for new mechanical blower building, 175 x 250 ft., at sewage treatment works. Cost about \$350,000 with machinery. George B. Gascoigne & Co., Leader Building, are consulting engineers. William Rogers is director of department.

Lancaster Carbon Co., Lancaster, Ohio, has work under way on modernization at former plant of Carbon Products Co., recently secured at a sheriff's sale, for manufacture of electric storage batteries, parts, etc. Howard Hileman is general manager.

Procter & Gamble Co., Gwynne Building, Cincinnati, manufacturer of soaps, washing powder, etc., has let general contract to

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conceivable purpose

Ferro Concrete Construction Co., Third and Plum Streets, for two-story and basement ad-dition to plant at Ivorydale. Cost about \$50,000 with equipment.

Konide Steel Products, Inc., Cleveland, has been organized by James V. Shur and Harry W. Lower, 1416 Standard Bank Building, to manufacture steel specialties.

manufacture steel specialties.

Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Jan. 2 for 700 spark plug thermocouple assemblies, gasket type (Circular 388); until Jan. 3, 53 oll temperature regulator assemblies (Circular 388); until Jan. 7, 40 sets lamp focusing gages (Circular 389); until Jan. 8, 11,000 ball socket washers, 42,000 flat washer, 245,000 aluminum alloy plain washer, 215,000 brass plain washers and 913,000 steel plain washers (Circular 386); until Jan. 10, 800 battery container assemblies (Circular 387).

Department of Public Service, City Hall, Columbus, Ohio, W. J. Loucks, director, will soon take bids for new municipal refuse incinerator plant. Cost about \$100,000 with furnaces, power equipment, mechanical-handling equipment, etc.

New York, Chicage & St. Louis Railroad Co., Conneaut, Ohio, plans rebuilding part of flue shop unit at locomotive repair shops, recently destroyed by fire. Loss about \$25,000 with equipment.

Board of School Commissioners, Hammond, Ind., plans manual training department in new two-story and basement school. Cost \$500,000. Financing has been arranged through Federal aid. J. T. Hutton & Sons, 5031 Homan Avenue, are architects.

Joseph E. Seagram & Sons, Inc., Lawrence-burg, Ind., distiller, has let general contract to J. & E. Warm Co., 2835 Florence Avenue, Cincinnati, for new 11-story storage and dis-tributing building, 130 x 250 ft. Cost about \$400,000 with mechanical-handling, loading and other equipment.

■ MIDDLE WEST

Concrete Engineering Co., 1926 South Fifty-second Avenue, Cicero, Chicago, manufacturer of steel window sash and allied products, has leased one-story building at 1942 South Fiftysecond Avenue, for expansion.

Commanding Officer, Rock Island Arsenal, Rock Island, Ill., asks bids until Jan. 15 for quantity of armor plate (Circular 180).

Harper-Wyman Mfg. Co., 8562 Vincennes Avenue, Chicago, manufacturer of gas range equipment and supplies, has asked bids on general contract for one-story addition, 50 x 75 ft.

Conduit Fittings Corpn., 1577 Ogden Ave-ue, Chicago, has been organized by William Katzberg and R. B. Schurig, to manufacture electrical fittings and equipment.

Town Council, Lamoni, Iowa, Martin A. Hynden, town clerk, asks bids until Jan. 8 for Diesel engine-generating units and accessories, switchboard, electrical equipment, distribution lines, etc., for new municipal electric light and power plant. Fund of \$100,000 has been arranged. Young & Stanley, Inc., Musceits III. catine, Iowa, is consulting engineer.

Sweetwater Brewery, Inc., Green River Wyo., is considering addition to double present capacity. Cost close to \$60,000 with matchinery.

Village Council, Spring Valley, Minn., has been authorized at special election to arrange bond issue of \$45,000 for new municipal elec-tric light and power plant and electrical dis-tribution lines.

Central Scientific Co., 460 East Ohio Street, Chicago, manufacturer of precision instruments, parts and equipment, has asked bids on general contract for modernization and improvements in three-story factory at 164-1714 Irving Park Boulevard, recently purchased for new plant.

Board of Education, 911 Locust Street, St. Louis, plans two manual training shops in new three-story and basement high school at Arsenal Street and Kingshighway, for which bids will be asked on general contract in January; seven laboratories and two mechanical drawing rooms will also be installed. Cost about \$1,000,000. Ernest T. Friton is commissioner of school buildings, in charge.

Dobry Flour Mills, Inc., Yukon, Okla., T. A. Dobry, president, has let general contract to Jones-Hettelsater Construction Co., Mutual

Building, Kansas City, Mo., for new multi-story grain elevator and flour mill. Cost over \$400,000 with elevating, conveying, screening and other equipment.

City Council, Frederick, Okla., has plans for new municipal electric light and power plant, and will begin work soon. Fund of \$137,000 has been secured through Federal aid.

Arkansas Power & Light Co., Pine Bluff, Ark., plans new power transmission line from McGehee to Watson, Ark., for electric light and power at last noted place and McArthur, Kelso and vicinity. Cost over \$70,000 with power substation and service facilities.

Board of Education, Library Building, Kan-sas City, Mo., plans manual training depart-ment in new two- three- and four-story and basement high school at Twenty-first Streat and Woodland Avenue, for which general contract is being let to Swenson Construction Co., Shubert Theater Building. Cost about \$650,000. Charles A. Smith, Finance Building, is architect; Nate W. Downes, last noted address, is consulting mechanical engineer.

Common Council, Burnet, Tex., asks bids until Jan. 11 for equipment for municipal waterworks, pipe lines, etc. J. W. Beretts Engineers, Inc. National Bank of Commerce Building, San Antonio, Tex., is consulting en-gineer.

■ WASHINGTON DISTRICT

Purchasing and Contracting Officer, Hole rd Quartermaster Depot, Baltimore, asl bids until Jan. 14 for hand and machine tools, including reamers, countersinks, drills, bids until Jan. 14 for hand and machine toom, including reamers, countersinks, drills, wrenches, clamps, lubricating guns, dies, sledges, taps, motor-driven lathe, motor truck jacks, chain hoists, etc. (Circular 90), one stencil cutting machine (Circular 93).

Blue Ridge Co., Inc., Glasgow, Va., an interest of James Lees & Sons Co., Bridgeport, Pa., manufacturer of woolen goods, has let general contract to John P. Pettyjohn & Co., Lynchburg, Va., for new mill at Glasgow, to include power house, machine shop and other mechanical units. Cost about \$250,000 with machinery. Ballinger Co., 105 South Twelfth Street, Philadelphia, is architect and engineer.

United States Engineer Office, Norfolk, Va., asks bids until Jan. 7 for parts for marine Diesel engines (Circular 1149).

Common Council, Highland Springs, Va., plans call for bids in January for pumping machinery, storage tanks, pipe lines, etc., for municipal waterworks.

Bureau of Ordnance, Navy Department, Washington, asks bids until Jan. 7 for gun forgings, gun barrel forgings, housing forg-ings and breech block forgings (Adv. 162).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 4 for steam and water pipe unions (Schedule 2505); until Jan. 8, copper-nickel alloy (Schedule 3977); until Jan. 11, spare parts for airplanes (Schedules 900-8036, 900-8037 and 900-8036). 8052), medium bar rivet steel (Schedule 3997) for Eastern and Western yards; until Jan. 8, one machine for testing ball bearings (Schedule 3996) for Annapolis Navy Yard; 10,880 lb. copper-nickel alloy forgings (Schedule 3992) for Washington yard.

♦ SOUTH ATLANTIC ▶

FED

Boards of Newberry, Fairfield and Union County Commissioners, Newberry, S. C., have engaged Daniel T. Duncan, Greenwood, S. C., consulting engineer for Board of Greenwood County Commissioners, Greenwood, as supervising engineer for proposed joint hydroelectric power project on Broad Enoree and Tyger Rivers, comprising power plant, substations and switching stations, and transmission lines for light and power in parts of three counties first noted. Cost \$7,500,000. Financing will be arranged through Federal aid. Mr. Duncan has plans for similar hydroelectric generating station at Buzzard's Roost on Saluda River for Board of Greenwood County Commissioners, for which fund of \$2,767,000 has been secured through PWA. About 184 miles of transmission lines will be built for service at Greenwood, Laurens and other points in Greenwood County.

Gulf States Cooperage Co., Tallapoosa, Ga.,

Gulf States Cooperage Co., Tallapoosa, Ga., care of S. P. McDonald, Jr., head, has leased plant of Shore Lumber Co., Quitman, Ga., and will remodel for manufacture of wire-





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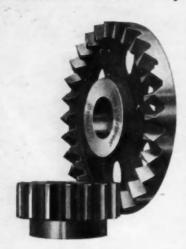


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bound barrels, barrel heads, etc. New machinery will be installed.

City Council, Hialeah, Fla., plans installation of pumping machinery and accessories, elevated storage tank and tower, purification plant, pipe lines, etc., for new municipal water system. Fund of \$68,000 is being arranged through Federal aid. Carl Riddle, 239 South County Road, Palm Beach, Fla., is consulting engineer.

◆ SOUTH CENTRAL ▶

United States Engineer Office, Louisville, asks bids until Jan. 15 for one 24-in. dredge pump and spare parts.

General Distillery Corpn., Louisville, care of Walter C. Wagner, Breslin Building, architect, has plans for extensions and modernization in plant at Frankfort and Melwood Avenues, including new equipment. Cost about \$80,000 with machinery.

Town Council, Algood, Tenn., asks bids until Jan. 4 for equipment for municipal waterworks, pipe lines, etc. J. A. Switzer, Knoxville, Tenn., is consulting engineer.

Buffalo Springs Distilling Co., Stamping Ground, Ky., has let general contract to H. G. Graham, Frankfort, Ky., for four-story addition, 60 x 100 ft., for storage and distribution, etc. Cost close to \$75,000 with equipment. Walter C. Wagner, Breslin Building, Louisville, is architect and engineer.

Louisville Gas & Electric Co., Louisville, plans transmission line to Pewee Valley district for light and power, including substation facilities, electrical distribution lines and operating facilities. Franchise is being secured. Cost over \$45,000 with equipment.

Common Council, Hamilton, Ala., asks bids until Jan. 3 for equipment for municipal waterworks, pipe lines, etc. Fund of \$35,000 has been arranged through Federal aid.

Falls City Ice & Beverage Co., Thirtieth Street and Broadway, Louisville, has let general contract to Dahlem Construction Co., 614 South Shelby Street, for extensions and improvements in bottling works. Cost over \$25,000 with equipment. Walter C. Wagner, Breslin Building, is architect.

◆ WESTERN PA. DISTRICT ▶

Spang, Chalfant & Co., Inc., Clark Building, Pittsburgh, manufacturer of seamless steel tubing, etc., has approved plans for one-story addition to mill at Ambridge, Pa., 60 x 240 ft., including new machinery and rearrangement of certain present coupling, threading and other equipment. Cost over \$150,000. Charles G. Dent is plant superintendent.

Pittsburgh Plate Glass Co., Grant Building. Pittsburgh, has plans for an annealing unit to sheet glass works at Clarksburg, W. Va. Cost over \$85,000 with machinery.

Page Pocahontas Coal Corpn., Welch, W. Va., has leased about 80 acres of coal lands in Virginia and plans early development, including installation of mining machinery, tipple, storage and distribution equipment.

■ MICHIGAN DISTRICT

George Weston Biscuit Co., Ltd., 134 Peter Street, Toronto, Ont., and 2 Brighton Avenue, Passaic, N. J., manufacturer of crackers and allied food products, has purchased former factory of Sanitarium Equipment Co., Battle Creek, Mich., defunct, and will remodel for new plant. Cost about \$200,000 with machinery.

Muskegon Brewing Co., Muskegon, Mich., recently ororganized, has plans for an addition, work to begin early next year. Cost over \$40,000 with equipment. Don Lakie, Grand Rapids, Mich., is architect.

Standard Heat Economizer Co. of United States, 711 Fidelity Building, Detroit, has been organized by Ward S. Van Dusen, adress noted, and associates, to manufacture fuel economizers and kindred engineering equipment.

◆ PACIFIC COAST ▶

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for one 40-ton outdoor electric gantry crane and runway at Mare Island Navy Yard (Specification 7855).

George Caswell Co., 442 Second Street, San Francisco, manufacturer of edible oils and other food products, has asked bids on general contract for new four-story plant. Cost about \$150,000 with equipment. Masten & Hurd, 233 Post Street, are architects.

Foundation Petroleum Corpn. of San Diego, Cal., care of A. A. Colninger, Chula Vista, Cal., president, plans development of oil properties near first noted place, including installation of drilling and operating machinery, pipe lines, steel tank farm for storage and distribution, and other structures. Company is arranging a stock issue totaling \$1,100,000, considerable part of proceeds to be used for purpose noted.

Bureau of Reclamation, Denver, asks bids until Jan. 21 for electrical equipment for Boulder Dam power plant, including switching, relaying and metering equipment, control boards with auxiliary equipment, terminal boards, distribution switchboards, battery charging sets, etc. (Specification 601); until Jan. 11, large quantity of insulated wire and cable (Circular 643-D).

Crown-Willamette Paper Co., Camas, Wash, has plans for three-story addition, 100 z 400 ft., to be constructed in two units, for storage and distribution. Each floor will be equipped with electric tramways, hoists, loaders and other mechanical equipment. General contract has just been let to Hoffman Construction Co., 715 S. W. Columbia Street, Portland. Cost over \$100,000 with equipment. Company headquarters are at 343 Sansome Street, San Francisco. H. N. Simpson is engineer.

Great Western Malting Co., Vancouver, Wash., care of Peter Schmidt, Olympia, Wash., head, recently organized, plans new plant on property to be leased from Port of Vancouver, with power house and machine shop. Cost about \$300,000 with machinery. J. R. Bowles, Portland, is interested in swe company. Galland-Benning Co., Milwauke, Wis., is engineer.

United States Coast Guard Headquarters, Washington, asks bids until Jan. 4 for complete gasoline fueling system for Coast Guard Air Station, Port Angeles, Wash., including 4700-gal. steel storage tank, hydraulic flotation type distribution system and accessories,

♦ FOREIGN ▶

Ministry of Labour and Industry, Government of France, Paris, has arranged program of public works to be carried out a 1985, including electrification of railroad lines to cost 1,300,000,000 fr. (about \$84,500,000), and electrification of waterworks and properties in different parts of country, costing 1,160,000,000 fr. (about \$75,400,000) with equipment.

Datsum, Ltd., Tokyo, Japan, manufacturer of Datsum automobiles and parts, care of Mitsubishi-Shoji-Kaisha, Tokyo, owner and operator, plans erection of new assembling works at Melbourne, Australia. Cost over \$350,000 with equipment.

William Dixon, Ltd., Govan Iron Works, Glasgow, Scotland, has approved plans for new coke plant, comprising battery of colorovens and auxiliary equipment for by-product gas service, latter to be used as fuel for bias furnaces and other service. New plant is scheduled for completion late in 1935. Com about \$750,000 with equipment.

Commissariat of Heavy Industry, Sovies Russian Government, Moscow, plans new works for production of automatic machine took, ifaluding, parts manufacture and assembling. Cost close to-#1,500,000 with equipment. Astory Trading Coppn., 261 Fifth 'Avenue, New York, is official buying agency.

Milwaukee Welding Chapter Organized

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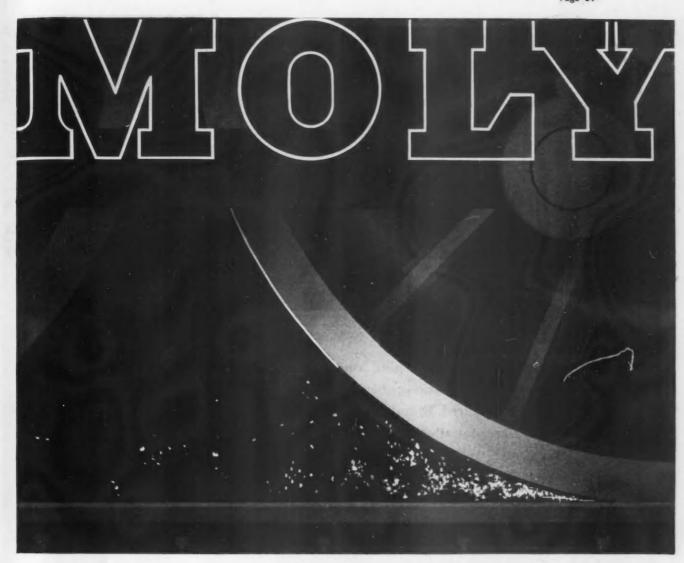
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TEMPORARY organization of a Milwaukee chapter of the American Welding Society has been effected at a joint meeting of members of the Chicago chapter and a group of Milwaukee welding engineers. Klaus L. Hansen, consulting engineer, Harnischfeger Corpn., was chosen temporary chairman, and John J. Clyde, welding research engineer, A. O. Smith Corpn., temporary secretary. A second meeting will be held about the middle of January to complete the organization and elect permanent officers.

Neil C. Hurley, president, and J. F. Roche, vice-president and operating head of the Binks Mfg. Co., 3106-56 Carroll Avenue, Chicago, have formed a new Canadian company to be known as the Binks Mfg. Co., of Canada, Ltd. The new company will be located at Windsor, Ont.



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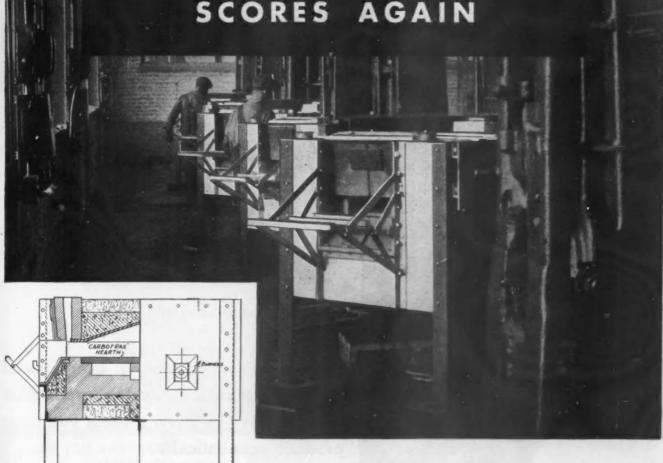
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AT the Dallas Division Plant, Revere Copper & Brass, Incorporated, is an interesting battery of furnaces designed by Continental Industrial Engineers Inc., for heating brass for forging.

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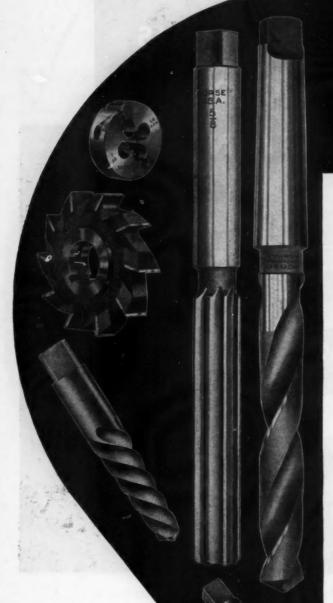
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Competition is forcing every metal working concern to watch production costs closely. To show a profit you must produce economically.

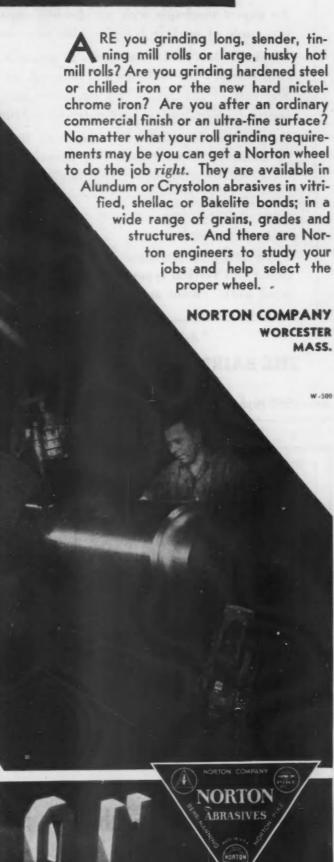
Morse Tools can give any manufacturer the speed and accuracy which he must have for profitable production. Morse drills, cutters, reamers, taps and dies work fast, last long between sharpenings, measure up to the top standards of accuracy and uniformity. They cut production costs.

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EXPERTS OR BAIRD MACHINES?

An expert mechanic with an obsolete engine lathe can turn out an accurate piece of work if you give him time enough.

To enable less skilled operators to attain similar accuracy in productionruns whereby the unit cost will be small, and without involving prohibitive first cost of the production machines sums up the achievements of the Baird 7" Horizontal Automatic Chucking Machine.

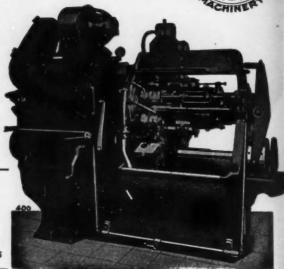
Its accuracy is inbuilt by competent Baird mechanics. Its continued fast operation is the result of good design and ample experience by Baird engineers. Example: time for single indexing and "air cuts" of the tools is only 2.15 seconds.

Baird chucking machines are made in horizontal and vertical types for chucked or centered work. Want an estimate?

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Since 1849 High Production Machinery for the Smaller Metal Parts



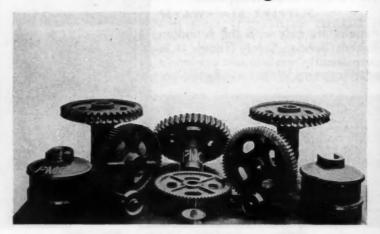
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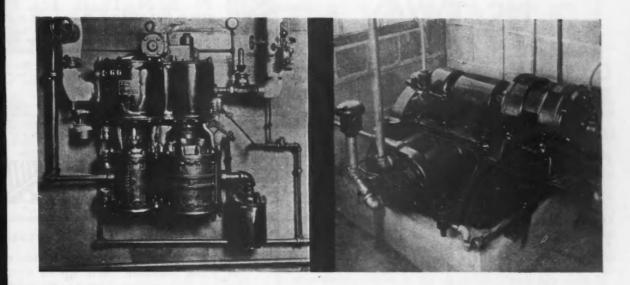
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WESTINGHOUSE AIR BRAKE COMPANY

JUST BETWEEN US TWO

"Personally, I ..

GENTLEMEN who have matters called to their personal attention and who never express anything but personal opinions have long galled us. But the all-time high for abuse of the ill-used adjective is in a letter recently received, beginning, "Owing to the personal illness of Mr." Oh, for an impersonal illness!

Understatement

A PROMINENT builder of textile machinery is quoted in the newspapers as saying that "two-thirds of the looms now in use are on their way to becoming obsolete." Conservative, we calls it. Three-thirds are on their way to obsolescence as surely as next Christmas is coming.

The Year's Last Sermon

YOU can't become a successful factory manager, or designer, or company head, or metallurgist, or sales manager, or purchasing agent, without spending a lot of money finding out what won't work.

A man's experience costs him or his employer what the boys term a pretty penny, for even Edison's batting average was less

than .600.

You always pay full, retail price for first-hand experience. The great bargains are found in other people's experience, a truth that is pretty widely realized, judging from the fact that several thousand trade papers are published in this country alone. We mention trade papers as evidence, for the main job of trade paper is to act as an experience-swapper in the field it

Which is why it gripes us no end to hear a man say, "I don't Which is why it gripes us no end to hear a man say, "I don't need a trade paper. I know everything there is about"

The week before we are going to quit the job anyway we are going to say, "You swelled-headed so-and-so. You're headed for the relief rolls." As it is, we have to buy shoes, pot roast, and so on, so we bite our tongue and say, "Of course, of course, Mr. Guckenheimer, we don't doubt that you are a genius, but new things keep coming up all the time."

It never does any good, for once a Guckenheimer, always a Guckenheimer. One satisfaction is that they are self-eliminating. You hear of 'em one year, and the next year the post office returns

You hear of 'em one year, and the next year the post office returns letters marked, "Gone. Address unknown."

A man can do worse than to make a New Year's resolution to scan every issue of his trade paper from stem to stern.

Orchid

MR. BENJAMIN M. COLLINS, assistant manager of W. W. Rosebraugh Co. ("If It's Made of Iron, We Make It"), Salem, Oregon, writes:

"Information desired by the board appointed to set a value on the water plant and distributing system now owned by the Oregon-Washington Water Service Corporation was obtainable only in The Iron Age.
"The City of Salem is negotiating with the above company to purchase the plant and the board is setting a value. We were very glad to loan them the issue they desired."

We Froth at the Mouth

THE incoherence that strikes prize fight radio announcers when the going is particularly exciting afflicts us when we try to describe the Annual Number, next week's issue. (Are ye listenin', eleven lerl, certified readers of this column?)

All we can do is gurgle and stutter. We are speechless. A lulu! Advertisers went hog-wild and made it our biggest issue since '31. And those paintings! If some of them don't make the Metropolitan, somebody's astigmatic. Only seven days to wait, maybe eight, for that multi-color printing is a pressroom headache, but wotta number! Hope we have enough extra copies to take care of special calls at \$2 each. It ought to be \$20.

Accolades, Two

A HEADLINE that stopped us in our tracks is, "Your Competitor May Be Smarter Than You Think," on Elwell-Parker's attractive page 77 in Dec. 20 IA. Migawd, maybe he is! A laurel wreath, too, to Armco for presenting facts about Armco 18-8 and 17 in handy tabular form (page 87, same issue). Readers like it that way.

May '35 be your happiest and best year since '29, or, if you want to go back a little further, '19.—A.H.D.



Cone 4-Spindle Automatics

Are economical and accurate producers of screw machine parts up to 6" diameter, 7" milling length. They cut costs, increase production, boost profits.

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Tapping Attachments and Multiple Heads



Landis makes a complete line of threading equip-ment. Depend upon it, if you have a thread-ing operation, Landis has a machine, die head or tap that will handle the job to better advantag

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9"x3' Back-Geared, Screw Cutting \$75

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has found a better way of doing a thing, the probabilities are that your business paper tells about it.

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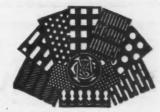
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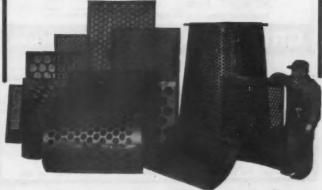
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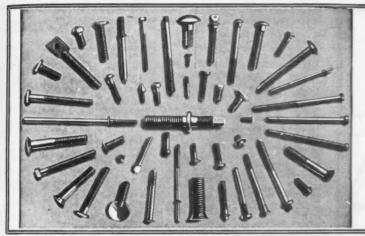


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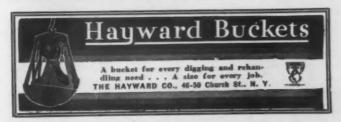
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LEATHER—Cup

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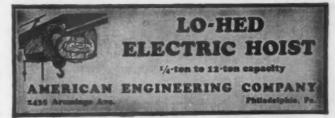
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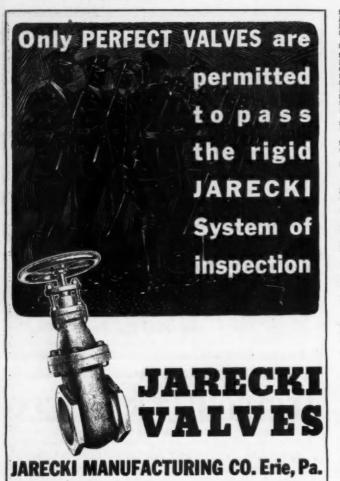
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American Rolling Mill Co., Middletown, O.
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Weitton (W. Va.) Steel Co.
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Republic Steel Corp., Youngstown, Ohio.
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American Sheet & Tin Plate Co., Ptgl.

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Weirton (W. Va.) Steel Co.
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Carnenter Steel Co., 121 W. Bern St.,
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Latrohe (Pa.) Electric Steel Co.

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Latrobe (Pa.) Electric Steel Co.

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Mass.

STEEL-High Speed

Bethlehem (Pa.) Steel Company.
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87EEL—Spring
Athenia Steel Co., 135 William St., N. Y. Barnes Glison-Haymond. Inc. Detroit.
Barnes, Wallace, Co., The, Bristol, Conn. Glison, Wu. D., Co., Chicago, M. Golden, Conn. Glison, Wu. D., Co., Chicago, Canton, Ohio. Timken Roller Bearing Co., Canton, Ohio. Timken Steel & Tule Co., The, Canton, O. STEEL—Stainless
American Steel & Wire Co., Chicago,
Bethiehem (Pa.) Steel Company.
Carnegie Steel Co., Pittsburgh.
Carpenter Steel Co., 121 W. Bern St.,
Reading, P.
Disston, H. & Sons, Inc., Philadelphia,
Illinois Steel Co., Chicago.
Latrobe (Pa.) Electric Steel Co.,
Luddum Steel Co., Watervilet, N. Y.
Midvale Co., The, Nicetown, Phila., Pa.
Republic Steel Corp., Youngstown. Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago,
Inc., Philadelphia, Steel Co., Cambridge, 38, Mass.

87EEL—Stainless Clad
Ingersoli Steel & Disc Co., Chicago.

87EEL—Tsel
Bethlehem (Pa.) Steel Company

Ingersoil Steel & Disc Co., Chicago.

STEEL—Teel
Bethlehem (Pa.) Steel Company
Blasett Steel Co., The, Cleveland
Carpenter Steel Co., 121 W. Hern St.,
Reading, Pa. Discon, 121 W. Hern St.,
Reading, Pa. Discon, Co., Chicago.
Ingersoil Steel & Disc Co., Chicago.
Ladium (Ra.) Electric Steel Co.,
Ladium (Ra.) Electric Steel Co., Addium (Ra.) Electric Steel Co., Y.
Midrale Co., The, Nicctorier, N. Y.
Midrale Co., The, Nicctorier, Phila., Pa.,
Miller, A., & Co., 745 Washington St.,
N. Y. G.
Syerson, Jos. T., & Son, Inc., Chicago.
Vanadium-Alloys Sisel Co., Latrobe, Pa.
Wheelock, Loveloy & Co., Inc., Carbridge,
Mass.

STEEL-Teel, Special Shapes Latrobe (Pa.) Electric Co. STEEL—Vanadium
Andrews Steel Co., The, Newport, Ky.
Latrobe (Pa.) Electric Steel Co.

STEEL PLANTS AND ROLLING MILLS Perin Engineering Co., Inc., 535 Fifth Ave., N. Y. C.

STENCILS—Brass Dickey-Grabler Co., Cleveland. STEPS—Ladder and Stairs, Safety
Blaw-Knox Co., Pittaburgh.
Central Iron & Steel Co., Harrisburg, Pa.
STOCKS AND DIES
Jones & Lamson Mch. Co., Springfield, Vt.

STOKERS
Babcock & Wilcox Co., The, 85 Liberty
St., N. Y. C.

STOPS—Crane Limit Electric Controller & Mfg. Co., Cleveland. STRAIGHTENING MACHINES—Bar & Tube

Tube
Conran, Frederick M., 107 Colden St.,
Newark, N. J.
Medart Co., The, St. Louis, Mo.
STRUCTURAL IRON AND STEEL
WORK

WORK
American Bridge Co., Pittsburgh.
Morgan Engineering Co., Alliance, Ohlo.
STRUCTURAL STEEL — See Angles,
Beams, Channels and Toes

SUPERHEATERS
Babcock & Wilcox Co., The, 85 Liberty
St., N. Y. C.
SWAGING MACHINES
Torrington (Ct.) Co.

SWITCHES-Electric Westinghouse Elec. & Mfg. Co., East Ptgh. TAGS-Metal Dickey-Grabler Co., Cleveland.

TANK LINING Cellcote Co., The, Cleveland. Celleute Co., The, Cleveland.

TANK LININGS—Rubber
American Hard Rubber Co., 11 Mercer
St., N. Y. C.
Goodrich, B. F., Co., Akron, Ohio.

TANKS—Compressed Air, Gas, Oil and
Water

Water Scalfe, Wm. B., & Sons Co., Ptgh. Westinghouse Air Brake Co., Industrial Div., Pittsburgh. TANKS—Elevated Wood
Hauser-Stander Tank Co., Cincinnati, Ohio.

TANKS-Iron and Steel Scaife, Wm. B., & Sons Co., Ptgh.

TANKS—Lead Lined Hauser-Stander Tank Co., Cincinnati, Ohio.

TANKS—Pickling
American Hard Rubber Co., 11 Mercer St.,
N. Y. C.
Blaw-Knox Co., Pittsburgh.
Hauser-Stander Tank Co., Cincinnati, Ohio.
Nukem Products Corp., 68 Niagara St.,
Buffalo.

TANKS—Rubber Lined
American Hard Rubber Co., 11 Mercer St.,
N. Y. C.
Blaw-Knox Co., Pittsburgh.
Hauser-Stander Tank Co., Cincinnati, 0.

TANKS-Water Hauser-Stander Tank Co., Cincinnati, O. TANKS—Welded
Blaw-Knox Co., Pittaburgh.
National Tube Co., Pittaburgh.
Scalfe, Wm. B., & Sons Co., Pittaburgh.
Dow Chemical Co., Midland, Mich.

TANKS—Weed
Hauser-Stander Tank Co., Cincinnati, O.
TAPPING MACHINES
National Automatic Tool Co., Richmond.

National Automatic Tool Co., Richmond, Ind.
TAPPING MACHINES—Nuts
National Michry, Co., Tiffin, Ohio.
TAPS—Collapsine
Landia Mach. Co., Inc., Waynesboro, Ps.
Murchey Machine & Tool Co., Detroit.
TAPS AND DIES
Landis Mch. Co., Inc., Waynesboro, Ps.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Pratt & Whitney Co., Hartford, Conn.
TEES—See Angles, Beams, Channels and Tess.

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TELEPHONES—Interior
Screw Machine Products Corp., Prov., R. L.
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Tin Plate Co., Ptgb. TERNE PLATES
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Jones & Laughlin Steel Corp., Pittaburgh.
Pacific Coast Steel Corp., San Francisce,

Jones Pacific Coast Steel Corp., Scalif.
Republic Steel Corp., Youngstown, O.
Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co.
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TINNING EQUIPMENT—Sheets
Wean Engineering Co., Inc., The, Warren,

Ohio.
TIRE SETTING MACHINES
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Chicago.
Chicago.

TOOL HOLDERS
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TOOLS—Lathe
Armstrong Bros. Tool Co., Chicago.
Carboloy Co., Inc., 2885 E. Jefferson Ava.,
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TOOLS—Metal Cutting
Carboloy Co., Inc., 2885 E. Jefferson Ava.,

Carboloy Co., Inc., 2985 E. Jenterson
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Haynes Stellite Co., 30 East 42nd St.,
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TOOLS—Tungsten Carbide
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Eaynes Stellite Co., 30 East 42nd St.,

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wankee.
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American Hard Rubber Co., 11 Mercer St.,
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TUBING—Nichrome
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TUBING—Open Seam
Steel & Tubes, Inc., Cleveland.
TUBING—Phosphor Bronze
Phosphor Bronze Smelting Co., Philadel-

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Garlock Packing Co., The, Palmyra, N. Y.
VALVES—Acid Resisting
Durinon Co., Inc., The, 438 N. Findlay
St., Dayton, Ohio.
VALVES—Air Operating
Westinghouse Air Brake Co., Industrial
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Thomson-Gibb Elec. Welding Co., Lynn,

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WIRE—Aluminum
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WIRE-Electric Heat Resisting Globar Corp., Niagara Falls, N. Y. WIRE-Flat, Round, Square or Special

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Barnes, Walisce, Co., The, Bristol, Conn.
New England High-Carbon Wire Co., Mill-bury, Mass.
Pacific Coast Steel Corp., San Francisco,

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Page Steel & Wire Co., Monessen, Pa.

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Seneca Wire & Mfg. Co., The, Fustoria,
Ohlo.
Webb Wire Works, New Brunswick, N. J.
Wickwire Bros., Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd
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WirE—Special, Drawn Shapes
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WirE—Spoke and Crimping
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Ohio.

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Jones & Laughlin Steel Corp., Pittaburgh.
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Roebling's, John A., Sons Co., Trenton, N. J.
Seneca Wire & Mfg. Co., The, Fostoria,
Ohio.

Ohio.

WIRE—Stainless Steel
Page Steel & Wire Co., Monessen, Pa.

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Air Reduction Salms Co., 50 East 42nd
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American Steel & Wire Co., Chicago.
Lincoln Electric Co., Cleveland.
Metal & Thermit Corp., 120 B'way.
N. Y. C.
Page Steel & Wire Co., Monessen, Pa.
Pittsburgh (Pa.) Steel Co.
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Ohio.
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Ohio.

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American Spring & Mig. Corp.,
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Hindley Mig. Co., Valley Falls, R. I.
Pittsburgh (Pa.) Steel Co.,
Titchener, E. H., & Co., Binghamton,
N. Y.
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Wickwire Bros., Cortland, N. Y.
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St., N. Y. C.

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Leschen, A., & Sens Rope Co., St. Louis,
Mo.,
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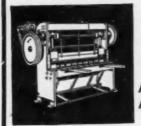


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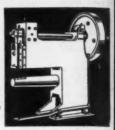
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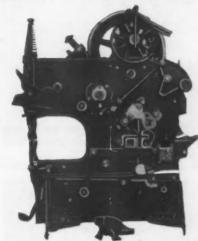
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We have the largest hot dip galvanizing plant and kettles in the United States. We have the most modern equipment to do first class galvanizing at lowest prices. Prime Western Zinc used exclusively. Galvanized products furnished sively. Galvanized products furnished.

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OF EVERY DESCRIPTION SMALLEST UP TO 24" HARDWARE SPECIALTIES

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BRASS AND BRONZE CASTINGS
1 lb. to 2000 lbs.
Capacity 16,000 lbs. per day
OUR SPECIALTIES
WORM AND GEAR BRONZE, BRIDGE
BRONZE, ACID PROOF BRONZE,
BRONZTOX BUSHINGS AND BARS.

A. W. CADMAN CO., Pittsburgh, Pa. Established 1860

Every week brings an opportunity for orders

Every week executives in the metal working industries look through these pages. Every week some of them have business to place under contract.

Every week some of them do place orders—some totalling thousands of dollars, not infrequently becoming permanent.

Your opportunities lie here also. First essential is TO BE HERE, REGU-LARLY, with adequate presentation of your facilities.

That is both easy and economical. Let us give you details.

BUSINESS **OPPORTUNITIES**

Representation New York City

Highly successful manufacturer's representative, covering 50 miles radius from New York City, with engineering office in less location, desires additional first class account on a commission basis.

ADDRESS BOX K-812 Care The Iron Age, 239 W. 39th St., New York

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EMPLOYMENT SERVICE

SALARIED POSITIONS \$2,500 to \$25,000

This thoroughly organized advertising service of 25 years' recognized standing and reputation carries on preliminary negotiations for positions of the calibre indicated, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by a refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If you have actually earned over \$2,500, send only name and address for details.

R. W. BIXBY, Inc.

HIGH GRADE MEN

Qualified candidates desiring salaried positions are invited to use our individual and confidential services in contracting responsible employers. We negotiate all preliminary overtures. Established 1915

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HIGH GRADE EXECUTIVES — WANTED High grade men capable of filling high salaried professional, sales, or executive positions, are offered our service. We are specialists on high class placement work, have nation-wide facilities for locating positions. Write for complete details.

EXECUTIVE PLACEMENT ASSOCIATES
Lafayette Building Buffalo, New York

HELP WANTED

WANTED: BLAST FURNACE MAN capable of constructing and operating small blast furnace. Give complete information and references in letter. Address Box K-673, care The Iron Age, 239 W. 39th St., New York.

SALES ENGINEERS — Men familiar with tool steel and tungsten carbide products. Salary, expenses and commission. Chicago and New England territories open. Address Box C-1020, care The Iron Age, 311 Union Bldg., Cleveland, Ohio.

DROP FORGING CONCERN, well established in Michigan, wants Manufacturers' Representative to handle account on commission basis. Write Box K-685, care *The Iron Age*, 239 W. 39th St., New York.

TWO EXPERIENCED ROLLING MILL DE-SIGNERS wanted by a large manufacture of steel plant equipment. Must be thoroughly schooled in all phases. Give complete information of your past record with salary requirements in your first letter. Address Box K-681, care The Iron Age, 239 W. 39th St., New York.

SALES ENGINEER with knowledge of tank and steel plate work. New England and Metropolitan territories. Plant located in Metropolitan area. Commission basis. Full or part time. State full qualifications first letter. Address Box K-688, care The Iron Age, 239 W. 39th St., New York.

WE WANT A PRODUCTION MAN in our truck tank department. We manufacture all kinds of oil delivery tanks and truck bodies. Must be a sheet iron mechanic, who knows welding and economic production, and well qualified in handling help. Please give experience, age, and salary expected. Boyle Manufacturing Co. Inc., 5100 Santa Fe Avenue, Los Angeles, California.

SITUATIONS WANTED

SALES EXECUTIVE, BROAD EXPERIENCE as Sales Manager and Purchasing Agent. Forgings, castings and steel products, desires position with an aggressive concern. Any location. Address Box K-676, care The Iron Age, 239 W. 39th St., New York.

SITUATIONS WANTED .

SALES ENGINEER—with experience and contacts on equipment and metal products for industrials in New York Metropolitan territory. Technical graduate with shop experience. Address Box K-689, care *The Iron Age*, 239 W. 39th St., New York.

GRADUATE CIVIL-MECHANICAL ENGINEER, desires position with future. Moderate salary. Locate anywhere. Twelve years' mechanical design experience. Single. Address Box K-660, care The Iron Age, 239 W. 39th St., New York.

PATTERN MAKER desires connection with manufacturing concern as foreman or superintendent of pattern department. Middle aged. Twenty years' experience as pattern maker on wood and metal. Complicated work, like motorhousing and manifolds, a specialty. Good references. August Angermann, 89 Lefferts Place, Brooklyn, N. Y.

EXECUTIVE OF SUPERIOR TYPE; capable mechanical engineer, practical mechanic and skilled inventor, with years of experience in machine industry; expert in design, development, production and factory management; 15 years Chief engineer and factory manager of prominent corporation. Address Box K-668, care The Iron Age, 239 W. 39th St., New York.

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Nothing Rolls Like a Ball

And in NOVEMBER 1934

Another impartial survey by a transmission chain manufacturer shows The Iron Age to be the most widely read publication in the metal-working industry.

This chain manufacturer wrote to a number of factory executives and designing engineers in metal-working plants and asked the two following questions:

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Thus the readers of industrial publications again give evidence of their interest in The Iron Age, and by so doing confirm the verdict rendered by 31 other surveys in the last three years involving over 8,000 opinions.

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